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The Naturalist

Seaweeds – Cinderellas of the Sea

Jane Pottas

YNU Presidential Address, delivered following the Annual General Meeting, 9 November 2019.

The last duty of the retiring YNU President is to give the Presidential Address. When I was asked to supply the title for my Presidential Address I suggested titles about the future of natural history societies in the UK and the challenges they face including an ageing demographic, or the contribution of amateur naturalists to scientific knowledge and research. Big topics. Important topics. However, these were immediately rejected and I was told that I was expected to give a talk about seaweed. I rarely hesitate to talk about this subject, in fact my husband says I can bore for England on it. I find this rather insulting – I have set my sights rather higher than a single country. So, a talk about seaweeds it had to be although I did slip in a couple of slides under the radar about natural history and the role of natural historians.

Fig. 1. Seaweeds on the shore at Flamborough

Fig. 2. *Dilsea carnosa* in a rock pool, St Mary's Island.

It is a fact that most visitors to the shore are not enthused by seaweeds. Children are more interested in starfish, crabs and fish (even dead ones); families go rock pooling hoping to catch fish or find hermit crabs; geologists sweep seaweeds aside to study the rocks beneath. Hardly

anybody looks at the seaweed. It's just brown and slippery; a nuisance and an inconvenience.

This negative view of seaweed is not a recent phenomenon. Two Roman poets did not regard seaweed very highly. According to Virgil (70 – 19 BC): *Nihil vilior alga* - Nothing more vile than seaweed; and Horace (65 – 8 BC): *Et genus et virtus, nisi cum re, vilior alga est* - Without substance, honour and valour are more worthless than seaweed. Oh, dear.

The choice of title came about because the word Cinderella has, by analogy, come to mean one whose attributes were unrecognized, or one who unexpectedly achieves recognition or success after a period of obscurity and neglect. This seems to describe seaweeds – at first glance brown and dull and unappreciated but on closer inspection many species are colourful and have a beauty all of their own (Figs. 1 & 2, p1). And besides, I do like a bit of alliteration.

My own journey of discovery of seaweeds spans almost 60 years from a family holiday to Shetland in 1960 to a visit to the shore at Saltwick earlier this year. But why seaweeds in particular? It all started with a visit to Whitby Community College by a group of students from Perth, Western Australia in 1998. They were on an annual sports tour and came to play rugby, netball and hockey. We hosted two students and a parent who was also the team doctor. They stayed three days and a chance conversation during their stay between the doctor and a supply teacher at Whitby, mentioned in passing on the day they left, led me to enquire about the possibility of doing some research at the Scarborough Campus of Hull University. I was offered a choice of PhD, either the recolonisation by barnacles of scraped rocks, or the morphology and distribution of a single species of seaweed. My final year undergraduate dissertation was on barnacles. I rather liked barnacles and didn't relish the idea of killing them in their thousands so really there was no choice to make. Seaweed. At that point I wasn't even certain that I could identify the subject of my study but from that inauspicious beginning seaweed seemed to take over my life. After eight years of part-time study I defended my thesis and thanked my supervisors for their confidence or naivety when they initially took me on as their student. As Samuel Johnson remarked, this was an example of the triumph of hope over experience.

A question I am often asked is "Seaweeds or algae?" If this conundrum has kept you awake at night an analogy may help. In the same way that farmed animals are a convenient if artificial grouping of distantly related organisms, seaweeds belong to a rather ill-defined assemblage of photosynthetic organisms known as algae. They are oxygen-generating, photosynthetic eukaryotic organisms other than embryophyte land plants and lichens, belonging to many different evolutionary lineages, and therefore highly diverse from a genetic point of view. This genetic diversity is reflected in the enormous diversity exhibited by algae in terms of morphological, ultrastructural, ecological, biochemical, and physiological traits. Algae are simple plants that can range in size from the microscopic microalgae, including cyanobacteria (formerly called 'blue-green algae'), dinoflagellates, bacillariophyta (diatoms)… etc., to the macroalgae, the large seaweeds, such as the kelps and fucoids.

Classification of the algae has proved problematic because they are so diverse, as can be seen in the history of taxonomy. Carl Linnaeus (1707–1788), Swedish physician, botanist and zoologist created a hierarchical system for all living things published as *Systema Naturae* in 1735. Coincidentally, Linnaeus and I share a birthday, the 23rd May – date and month but not year!

In Linnaeus's Key of the Sexual System of Plants the flowering plants and conifers constituted the first 23 classes. They were described as having Public Marriages in which there were two subdivisions: husband and wife have the same bed; and husband and wife have separate beds. The 24th and last class were the plants with clandestine marriages. Here he lumped together the plants lacking flowers and seeds - the ferns, mosses, fungi, lichens and algae. These Linnaeus called Cryptogamia, meaning 'secret wedding' a term derived from the Greek kruptos 'hidden' plus gamos 'marriage' (because the means of reproduction was not apparent). I gave several talks about seaweed in the Attenborough Studio when I worked at the Natural History Museum, London. In one talk I explained that I worked in the Cryptogamic Herbarium which houses specimens of mosses, liverworts, lichens and algae, organisms which are grouped together because they have hidden reproductive parts. I added that this same description could also be applied to the researchers who work there!

The sexual basis of Linnaeus's plant classification was controversial in its day. There were, however, quite a few exceptions and some critics attacked it for its sexually explicit nature. One opponent, the botanist Johann Siegesbeck, called it "loathsome harlotry" but Linnaeus had his revenge when he named a small European weed *Siegesbeckia*. What has survived of the Linnaean system is its method of hierarchical classification and custom of binomial nomenclature.

William Henry Harvey (1811 – 1866) Irish botanist, algologist, botanical artist, illustrator and lithographer in 1836 proposed a system of classification on the basis of the habitat and the pigments of the seaweeds: red algae (phylum Rhodophyta), brown algae (phylum Ochrophyta, class Phaeophyceae), and green algae (phylum Chlorophyta).

In contrast to the Linnaean system of classification, phylogenetic classifications attempt to reflect evolutionary relationships among organisms or groups of organisms. In one consensus phylogeny of eukaryotes, which is based on molecular and ultrastructural data, most of the presently known eukaryotes can be assigned to one of eight major groups (Baldauf, 2008). In this phylogeny algae occur in 6 of the 8 major groups.

This phylogenetic tree illustrates that 'the algae' are indeed an artificial and highly heterogeneous aggregation from many different evolutionary lineages - single celled or multicellular; arising around 2 billion years ago; found almost everywhere there is light for photosynthesis; and reproducing by spores and/or egg and sperm-like cells (see Fig.3, p4). The marine macroalgae, or seaweeds, are plant-like organisms that generally live attached to rock or other hard substrata in coastal areas. They have no roots, no leaves, no flowers, no true xylem (although kelps do possess conducting tissues) and naked seeds. Seaweeds are represented in two of the major groups in the eukaryote domain, the Archaeplastida which includes the land plants and the red and green algae, and the Stramenopila or Heterokonta which includes the brown algae.

Current estimates put the number of seaweed species worldwide between 12,000 and 15,000. In reality we just do not know how many species there are. This can be explained in part because taxonomists regularly revise the nomenclature and classification of organisms and because taxonomists are either splitters or lumpers – splitters in the morning and lumpers in the afternoon! As a rough guide there are around 1800 green, 2000 brown and 7200 red species worldwide, and the UK has about 115 green, 195 brown and 350 red (including some 40 non-native). A single shore in the UK may have over 100 different species of seaweed. Surprised?

Fig. 3. a) *Volvox aureus*, a species of green alga commonly found in lakes, ponds and ditches, b) *Spirogyra*, a green alga, c) *Dunaliella salina* green microalga especially found in sea salt fields, d) Stromatolites in Shark Bay Australia – cyanobacteria, e) *Fucus vesiculosus* (bladderwrack), f) *Ulva* sp., g) *Delesseria sanguinea.*

Although only extending to 8-40m depth in most oceans, some seaweeds are found to depths of 250m in particularly clear waters, e.g. of the Mediterranean and the Caribbean. Giant Kelp *Macrocystis pyrifera* is a large brown alga common along the coast of the eastern Pacific Ocean from California to Alaska and in the southern oceans near South America, South Africa and Australia. It is one of the largest seaweeds in the world - individual specimens may grow to 60m tall at a rate of 60cm per day, forming dense stands known as kelp forests which are home to many marine animals that depend on the algae for food or shelter.

Seaweeds will grow wherever there is a suitable substratum whether bedrock or other stable surface but not all the UK species are found growing on every shore. Their distribution is determined by abiotic factors such as desiccation, wave action, light, temperature, aspect, slope, turbidity, substrate and biotic factors such as competition and grazing. The effects of these variables acting singly and in combination are tolerated to different degrees by different species resulting in zonation patterns across shores and on vertical structures.

Intertidal seaweeds are adapted to spend part of their life out of water and part of it submerged, their location on the shore being related to the ratio of emersion and immersion times. When submerged they may be grazed by fish and snails and moved by the tide. When the tide is low and they are exposed to the air they are subject to desiccation, temperature change from sub

zero to 30°C plus, changes in salinity which can vary considerably from normal (36%) to high as a result of evaporation and to low due to rainwater and freshwater runoff. As land dwellers, we tend to see seaweeds only when the tide is out when they lie draped over the rocks, a lifeless slippery carpet of fronds of muted hues. However, even a cursory look reveals various growth forms such as the foliose *Ulva*, *Porphyra* and *Palmaria*; the calcareous *Corallina*, *Padina* and pink crusts; the filamentous *Polysiphonia*, *Ceramium* and *Chaetomorpha*. A hand lens is a useful tool to help identify some seaweeds in the field but better to take samples to examine under the microscope at low and high magnification. The cellular arrangements revealed by magnification allow differentiation between uniseriate and multiseriate species, the presence and extent of cortication and the shape and arrangement of subcellular structures such as plastids and pyrenoids. Seaweeds really are more interesting than just a brown mass on the shore at low tide.

Seaweeds are keystone species and as such are important ecosystem service providers. As primary producers they make food for themselves and other species, they provide habitat, shelter and protection for many animals such as nurseries for fish and molluscs, and they act as coastal defence by buffering wave action. In terms of value to humans they release oxygen and are an important carbon dioxide sink. As an economic and commercial resource they provide food, fodder, fuel, pharmaceutical products, and are useful as biofilters and in bioremediation.

Seaweeds have long been an important resource and a popular subject for many artists in the 18th and 19th centuries were scenes of seaweed gatherers. Peter de Wint (1784–1849) painted seaweed gatherers on the shore at Redcar. That seaweed harvest was probably destined for fodder or as a fertiliser for farming.

Seaweed is a significant component of the human diet in some parts of the world, in particular in Asia and in Celtic populations in Europe. In Japan, Korea and China seaweed cultivation is a major industry. It was a British phycologist, Kathleen Drew Baker (1901–1957), a lecturer andresearcher at Manchester University, whose work in unravelling the life history of *Porphyra* saved the Japanese seaweed industry.

Fig 4. Specimen of *Alaria esculenta* in the Cryptogamic Herbarium, NHM.

Dr Drew Baker died unaware of how her research was to alter the future of the nori industry by enabling them to develop artificial seeding techniques and reliable harvests. In the 1960s a monument dedicated to her was built in Sumiyoshi Shrine Park, Osaka, and each year the Drew Festival, attended by nori industry leaders and others, is held on April 14 to commemorate the work of the scientist who is known there as the Mother of the Sea. The economic importance of seaweed has hugely expanded and today the global seaweed market is valued at approximately 59.61 billion US dollars (Shahbandeh, 2019).

In 2010 I was fortunate to be offered the first of three short fixed term contracts at the NHM, London, where I worked as a research assistant in the Cryptogamic

Herbarium studying and databasing seaweed specimens in the algal collection which contains around 300,000 specimens from around the world, dating back to 1690. One of the seaweeds I databased was a specimen of *Alaria esculenta,* which happens to be the largest seaweed specimen in the NHM collection (Fig. 4, p5). It was collected in Whitby in June 1866 by Edward George from Forest Gate in London along with several other species of seaweed.

Perhaps Edward George was on holiday in Whitby at the time. A Mr and Mrs George from London are included in the 'List of Visitors' published in the *Whitby Gazette* on 30th June 1866, staying in Royal Crescent. He may also have visited Whitby Museum but if so he did not sign the Visitors' Book. This particular specimen of *A. esculenta* is in remarkably good condition. I do not suppose that Edward George went diving for specimens so it must have been lying on the shore. *Alaria esculenta* is less robust than other kelp species and starts to disintegrate soon after being detached so he must have been lucky to find it soon after detachment. He was lucky to find any *A. esculenta* at all. I have rarely seen any in over 30 years' visiting the local shores. It is just not that common.

I successfully arranged a loan of this specimen for the centenary year of Whitby Naturalists' Club in 2013 but when I tried to arrange a loan of this specimen for the YNU Presidential Address in 2019 it could not be done. As an amateur natural historian with no academic contract it is more difficult to justify the need for a loan and the NHM has tightened up loan procedures. A show-and-tell by an amateur in a small provincial museum seemingly doesn't cut the mustard any more. Maybe we should demand its repatriation – it did come from Whitby, after all. Perhaps surprisingly for a museum in a coastal town, Whitby Museum has no algarium so I am in the process of making one. I am collecting and pressing specimens of seaweeds from along this coast – and looking out for another specimen of *Alaria esculenta*.

Seaweeds are also useful as indicators of environmental health and change but for this to be possible we need to know where seaweeds are found and when. Herbaria in museums are useful repositories of information, as are biological recording databases such as the NBN Atlas, which is the UK's largest collection of biodiversity data supplied by individual recorders, groups and recording schemes. Users can interrogate biological records and habitat information and produce reports, summaries and distribution maps – with the proviso that such maps do not necessarily show the actual distribution of a species. Every record contributes to the overall picture so it is important to record the common species, which are often overlooked or ignored, as well as the rarities. Absence of evidence is not evidence of absence.

One use of such databases is to map the occurrence and distribution of non-native species. A non-native seaweed of interest is *Sargassum muticum*, a native of Japan first found outside its normal distribution range in British Columbia in 1944. It was first documented in the UK when unattached plants were found at Southsea Castle in 1971 and later as attached plants at Bembridge, IoW on 17th Feb 1973. Unattached and attached specimens are in the NHM herbarium. *Sargassum muticum* arrived with imported Pacific oysters via France/Canada either as whole specimens which were used as packaging and discarded once the cases were opened or as algal spores attached to shells. It is probably the only seaweed to have appeared on a Wanted poster! Initial attempts to eradicate *S. muticum* from the UK proved unsuccessful and it has since spread up the west coast of Britain and has been found as drift in Orkney. Marine scientists, both professional and amateur, can add to knowledge of the distribution of this and other non-native seaweeds by recording their presence, either as drift or attached plants,

wherever and whenever they find it. In this way a temporal and spatial record can be built up to show the range and extent of non-native and endemic species. These records can be analysed to look for correlation or causal effect.

In its original sense history meant description or systematic account and natural history was regarded as a descriptive and analytical science. Over time, however, the meaning has changed and in the Merriam Webster dictionary it is defined as "the study of natural objects especially in the field from an amateur or popular point of view". As natural historians we must reclaim the original meaning. Natural history societies are repositories of vast amounts of experience and knowledge and difficult as it is to maintain links with academia, especially for those of us without an academic contract, we can make our own contributions to the field of natural history in our many fields of interest, whether it be seaweeds or any of the other groups we are interested in and we must persevere, even when snubbed by requests to the NHM. We can also encourage others to carry on the tradition established and maintained in the many natural history societies such as Whitby Naturalists' Club.

I have tried to share with you my interest in seaweeds and hope I have helped to bring them out of obscurity and persuaded you that they are worthy of closer inspection.

For over 150 years the YNU has been devoted to the study and recording of Yorkshire's flora and fauna. Where once the term "flora and fauna" encompassed people's understanding of the classification of living things (back in the mid 1800s) it does not reflect our current understanding of the diversity of life on earth. As times change, so should the YNU. The founding members were almost exclusively white males with mutton chop beards, hats and walking sticks but just as these accoutrements are no longer a condition of membership so the remit of the organisation should be updated and instead of Yorkshire's flora and fauna it would be more accurate to say Yorkshire's biodiversity because this would then include all the other groups - including the seaweeds.

It has been my privilege to serve as YNU President and it is with pleasure that I hand over to the new President – welcome to Judith Allinson!

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A Figure in the Fog: George Edward Massee

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George Edward Massee (Figure 1) was a Yorkshire mycologist. Born in Scampston, he would go on to succeed Mordecai Cubitt Cooke (1825-1914) at the Royal Botanic Gardens (RBG), Kew, to become the British authority on mycology in the late nineteenth and early twentieth centuries. In this position he wrote numerous texts on multiple facets of mycology with many of these becoming the standard texts in the discipline. Indeed, some were still recommended as late as 1975 (Holden, 1975). Outside of his position at Kew, he served as the first President of the British Mycological Society and later was the second Chairman of the Yorkshire Mycological Committee. His contributions to Yorkshire mycology are particularly notable, given his co-authorship with Charles Crossland (1844-1916) of *The Fungus Flora of Yorkshire* (Massee & Crossland, 1905), which was the first regional mycota produced and quickly became a reference text for other mycologists seeking to document the fungi of their regions.

His early life was tumultuous, though it held the seeds of promise for the authoritative scientist he would later become. Born on 20th December 1850, the son of a farmer, he attended a private school and then the York School of Art, winning the national medal for the drawing of plants from nature. From there, he went to attend Downing College, University of Cambridge, where an altercation with his supervisor led to him being sent down. Afterward he travelled to the West Indies and South America, at the behest of his cousin Dr Richard Spruce (1817-1893). Returning via a French boat, he joined the French Foreign Legion, transferring to the 4th Chasseurs (receiving a tattoo of the regiment on his arm) in order to join the Franco-Prussian War before being called back by his mother. He achieved all this before he turned 25 (Blackwell, 1961; Ramsbottom, 1917a, 1917b).

This is the narrative put forward in Massee's most high-profile obituaries and accepted by the most recent academic work on Massee (Waterfield, 2016), alongside reference texts on the history of mycology (Ainsworth, 1996). It is also largely false. George Edward Massee was born on 20th December 1845 not 1850.[1] He decided to claim a different date of birth sometime between 1891 and 1901, recording so on the census of the latter year. Furthermore, whilst he did attend the York School of Art and win the National Medal in drawing plants from nature,[2] alongside other awards, he does not seem to have studied at the University of Cambridge. Whilst his leaving before graduation would excuse his absence from *Alumni Cantabrigienses*, no record exists for him in either the matriculation record of Downing College[3] nor any other college within the University of Cambridge.[4] He did, however, travel to South America, being credited as recording numerous species in and around Loja, Ecuador, in 1869 (Spruce, 1884). In light of the evident falseness of several of his verifiable claims, those that are harder to verify, such as his claim to have joined the French Foreign Legion, must also remain suspect.

Massee's witnessing of and participation in the acrimonious dismissal of Cooke from RBG, Kew, on the grounds of Cooke's advanced age (English, 1987, p249) likely spurred on his choice to attempt to disguise his own age. The impact of Massee's decision, however, is unclear. Sir David Prain, who was Director of the RBG, Kew, believed Massee's date of birth to be 20th December

1846, a date neither claimed by Massee nor matching his birth certificate. Despite this, Prain repeatedly sought and achieved the extension of Massee's service past his official retirement date of 19th December 1911, which allowed Massee to retire on 31st March 1915, a date that closely matched the date of birth Massee claimed in the census.[5]

Further, Massee's use of the census, and to do so with 'legitimacy' also shares similarities with Cooke, who used the census to disguise his relationship with his step-daughter (English, 1987, p90). Similarly, his choice to effect a limited university education could also have been influenced, or even suggested by Cooke, whose own claims of affiliated degrees have been shown to be suspect (English, 1987, pp174, 182). There would undoubtedly have been pressure on Massee to prove he was a man of science as opposed to an amateur "happy fungus hunter" (Grove, 1892), working as he did during a period of divergence between professional biology and amateur natural history (for more on the amateur-professional conflict in science see Alberti, 2001; Allen, 1998, 2009; Desmond, 2001; Kargon, 1977; Lowe, 1976).

However, Massee's claims go far and above those of Cooke. Whilst Cooke claimed to have received an honorary MA from St Lawrence University, Canton (a rather small institution) and more vaguely to have received an LLD from a college in New York, Massee claimed attendance at the University of Cambridge; a world renowned institution whose records would have been in easy reach of any curious persons. That Downing College admitted only 106 students between 1865-1873 with an average of only 12 students per year[3] only highlights the brazenness of the lie. Indeed, Massee was likely aware of this. In his profile for the *Journal of the Kew Guild,* where he provided his own biography, he refrained from mentioning his supposed stay at Cambridge and service with the French Foreign Legion. He does, however, give his date of birth as 1850 (Anon, 1908).

Figure 1. George Massee, alone, refereeing an early YNU fungal foray.
Reproduced with permission of Tolson Memorial Museum, Huddersfield.

Furthermore, the lies were not consistent with each other. Whilst the addition of soaking his supervisor, appearing in Blackwell's account via Massee's son (Blackwell, *loc.cit.*), adds only detail to the previous account by Ramsbottom, a third account provides an altogether different narrative. The American mycologist George Francis Atkinson (1854-1918), who visited Great Britain in 1903 and spent considerable time with Massee and other Yorkshire mycologists, kept a diary of his travels and wrote:

> "Massee was a student at Cambridge for three years and had he stayed one year longer he would have gotten his degree. But an opportunity came to go to Brazil. Here he went for several years. Comes back to England he did not want to stop active work to complete his course. They had given him some kind of a promise that his work in Brazil would be accepted, but in addition to this they wanted some kind of a thesis, or examination or something of the kind. It would not have been much, but Massee being rather independent, and thinking they ought to give him the degree, stood out against the thesis or examination and lost his opportunity. He has rather regretted it since for as he says, it has rather left him out of the close associations of friendship and alumniship which are the possessions of those who graduate."[6]

This version of events, whilst including the key component of study in Cambridge, is inconsistent with either of the versions provided by Ramsbottom and Blackwell. Here Massee leaves Cambridge but remains a student and is only dismissed on his return. He also stays at Cambridge for a substantial period of time that would have seen him miss the Franco-Prussian War before he had even set off to South America, given his claimed date of birth of 1850.

The untruths established and the reasons for their existence explored, the next question becomes who, if anyone, knew the truth? Given that his deception extended to his wife (where his marriage certificate claims his age to be 37 in 1892[7], so tacitly giving his date of birth as 1855) and to his children; the original source of the information was his daughter, Ivy (Ramsbottom, 1917a, 1917b), and that it is from his son, the entomologist Arthur Morel Massee, that the story of his altercation in Cambridge originates (Blackwell, *loc.cit.*), it is unlikely to have been an open secret. This is further supported by the fact his death certificate cements his age of death as 67[8] (and thus his date of birth as 1850).

John Ramsbottom (1885-1974), the Keeper of Botany at the British Museum from 1929 to 1950 and who was highly critical of Massee (Smith, 2020), wrote of Massee's work:

> "My feeling about his work is that one cannot accept his original statements on trust. All must be verified. They may be brilliant interpretations or they may be absurdities simulating boyish pranks in a superfluity of naughtiness." (Ramsbottom, 1948, p27)

However, Ramsbottom is also the source for much of this biographical information (receiving it from Massee's daughter Ivy), so can also be assumed to be unaware of the inauthenticity, or at least unsuspicious enough to let them pass unchecked. Despite his numerous criticisms of Massee's mycological work and substantial published output, he did not challenge Massee's claimed biography in print. The above statement then is ironic in its accuracy to a situation Ramsbottom likely knew little about.

Given the similarity in method and nature between Massee and Cooke's lies, it is quite possible that Cooke knew. However, no correspondence has been found regarding the situation.

Similarly, Crossland's presidential address to the YNU (Crossland, 1908) is notably sparse on Massee's early biographical details, neither mentioning Massee's stay at Cambridge nor his exotic travels. Crossland also had much to gain from Massee's presence at Kew; it gave the Yorkshire mycologists access to an institutional herbarium, and was where Crossland's own herbarium was later sent, and helped them acquire much-valued foreign correspondence, such as in the case of Massee linking Professor Hans Oscar Juel (1863-1931) to Henry Thomas Soppitt (1858-1899).[9] These benefits would have been lost had Massee been exposed as a fraud and suspicion might fall upon Yorkshire mycologists for embracing Massee so thoroughly. It is possible, however, that the vast majority of Yorkshire naturalists and mycologists might not have heard the of Massee's claims—let alone have been suspicious of them. Indeed, Blackwell wrote "I had thought he had no University education since he had no University degree" (Blackwell, *loc.cit.*, page 60), highlighting how little Massee's untruths may have spread throughout the mycological community. However, that these claims were told to George Atkinson means that some Yorkshire mycologists were also likely to be aware of them.

Finally, it is also important to note that Massee's assertions to have studied at Cambridge and to have served in the Franco-Prussian War, unlike his claimed date of birth, were never published by him. Rather, they were told in personal exchanges to his children or to visiting colleagues and were only published after his death. Outside of the three recorded sources, it is unclear how many people were told these stories and, of those told them, who believed them. Certainly, the misinformation only gained traction in the years after Massee's death, largely as a result of Ramsbottom's obituaries becoming the definitive account of Massee's life and work, and is widely held to be true today.

Ironically, Massee's lies are revealing. His emphasis on creating a persona that was middle-class, formally educated, with experience of both foreign travel and military service, highlight the expectations placed on British researchers during the period of transition between the 'gentlemen of science' and the 'professional biologist.' Notably, neither of these two ideals made space for the provincial amateur. In attempting to please everyone, he created an elaborate backstory that ticked all the boxes required for acceptance into elite scientific society, but which fail to hold against the slightest scrutiny. Arguably, his later achievements justify his deception. His work, undoubtedly his own, helped bridge mycology's transition from the pursuit of the lone amateur to an institutionally supported discipline and highlights the success amateurs enjoyed in the emerging field of mycology. Atkinson, in his diary, wrote: "Massee is characteristicand [sic] hard to describe".[6] Ever a figure in the fog, one thing about Massee is nonetheless clear: in more ways than one, he was a self-made man.

Notes

1. George Massee Birth Certificate Year 1846 Qtr: Mar District :Malton Union Vol:24 Page:443
2. Annual reports, York School of Art, Available at Explore York Libraries & Archives Item Y/CUL/3/1/7. Minutes of Proceedings, York School of Art, Available at Explore York Libraries & Archives Item Y/CUL/3/1/1.
3. Downing College Admissions Register. Available at Downing College Archives. Item DCAT/5/1/2
4. University of Cambridge Matriculation Register. Available at the University of Cambridge University Library, Item Matr.17
5. Sir David Prain to the Secretary of the Board of Agriculture and Fisheries 28 October 1911.

Original manuscript part of series of correspondence in "Extension of Services of Mr. G. Massee, Assistant Keeper" in RBG, Kew, Archives Item Herbarium Staff 1864-1917.

6. Atkinson's 1903 European diary. Available online from Cornell University at http://www.plantpath.cornell.edu/CUPpages/Atkinson/Atk-bibliography.html
7. Marriage Certificate Year: 1892 Qtr: Mar District: Richmond, S. Vol:2A Page:483
8. George Massee Death Certificate Year: 1917 Qtr: Mar District: Richmond Vol:02A p1317.
9. George Edward Massee to Hans Oscar Juel 21 February 1896. Original letter in Uppsala Library Archives Item G128g.

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The Future of the Natural Sciences Forum

Andy Millard, Chair, YNU

The Natural Sciences Forum (NSF) evolved from its predecessor, the Natural Sciences Committee (NSC), which was established in 2004 to discuss matters of natural history importance in the county and to act as a conduit for members and affiliated societies to pass ideas to the Executive. The then YNU constitution stated that the NSC should comprise the Executive Officers of the Union, officers of the Committee, representatives of each section and a representative of each Affiliated Society. The intention was for the Executive to delegate detailed consideration of most issues relating to promoting the Union's objectives to the NSC which, in turn, could make policy recommendations to the Executive.

In 2013 it was considered that the rather formal structure of the NSC was not functioning as well as it might and the YNU Constitution was amended to replace the NSC with the NSF, which has a much looser structure. The only NSF post-holder mentioned in the 2013 Constitution is the Chairman, to be appointed by the Executive. Representatives of YNU Sections, VC Divisional Secretaries and Affiliated Societies are **encouraged** to attend NSF meetings to ensure that the YNU is meeting their requirements, as are any YNU members and guests wishing to contribute ideas for the development of the YNU, and willing to take action to deliver them.

The NSF is expected to meet at least twice a year, one of these meetings being on the same day as the AGM and the other usually immediately preceding the spring Executive meeting. Attendance at NSF meetings on AGM days has understandably held up reasonably well as members have a day of YNU activities, making it worthwhile travelling the long distance for those who have to. However, recent spring meetings of the NSF have been very poorly attended with often just Executive members coming along before the Executive meeting in the afternoon, rather defeating the objectives of the NSF completely!

At the present time we do not have a Chairman (or Secretary) for the NSF so its continued existence is thrown into some doubt anyway. Nonetheless, maintaining effective channels of communication between affiliated societies and the YNU is seen as critical for its effective functioning and, apart from lobbying individual members of the Executive, the NSF has been the only formal structure to facilitate this. The matter received some consideration at the 2019 AGM and this year's February Executive Meeting, resulting in two strands of thought:

1) The NSF meetings need something extra to make them worthwhile attending. Suggestions included: a) guest speaker; b) making them more of a social event; c) arranging for affiliated societies to host the NSF so that it moves around the county; some combination of all three.

2) To facilitate better communication between the YNU, its affiliated societies and individual members, modern technology should be employed in the form of something like a private Facebook group or some other kind of similar online forum where individual members and affiliated societies could post their ideas.

The Executive would very much welcome practical offers of assistance with determining the future of the NSF and enhancing communication across the YNU generally, particularly from

representatives of affiliated societies (e.g. offers to host a meeting of the NSF, possibly coupled with other activities). Please send any offers, suggestions etc. to the Chairman (editor@ynu.org.uk) or any other member of the Executive.

Yorkshire Auchenorrhyncha – Part 2, Cicadomorpha – Membracoidea: Membracidae (treehoppers), Cicadellidae (leafhoppers) (excluding Deltocephalinae and Typhlocybinae) and Ulopidae (planthoppers)

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Introduction

The Membracidae (treehoppers) are represented by two species in Britain, one of which is recorded from Yorkshire. The Cicadellidae (leafhoppers) is the largest hemipteran family with over twenty thousand species world wide; in Britain there are approximately 300 recorded species representing 12 subfamilies, of these 239 are recorded from Yorkshire. The taxonomy of the family Ulopidae is unresolved in that some authors regard it as a subfamily of Cicadellidae; in Britain it is represented by two species, one of which is recorded from Yorkshire. They are all phytophagous and although some species cause leaf damage when feeding none are agricultural or horticultural pests in Britain. Overall the number of records held by the YNU is insufficient to truly represent current distribution and status.

The following list is the second of four parts which represent all currently recorded Yorkshire Auchenorrhyncha and follows the format in Part 1 (Foster, 2019).

Infraorder: Cicadamorpha
Superfamily: Membracoidea
Family: MEMBRACIDAE Rafinesque, 1815 (treehoppers)
Subfamily: CENTROTINAE Amyot & Serville, 1843
Centrotus cornutus (Linnaeus, 1758)
VC61, VC62, VC63, VC64: rare, brambles, 1922-1976.

Family: CICADELLIDAE Latreille, 1817 (leafhoppers)
Subfamily: AGALLIINAE Kirkaldy, 1901
Agallia brachyptera (Boheman, 1847)
VC61, VC62, VC63, VC64: scarce, trefoils, 1921-2018.
Agallia consobrina Curtis, 1833
VC61, VC62, VC63, VC64: frequent, Bittersweet *Solanum dulcamara*, Bellbine *Calystegia sepium*, Ivy, Nettle *Urtica dioica*, 1926-2016.
Anaceratagallia venosa (Fallén, 1806)
VC61, VC62, VC63, VC64: uncommon, trefoils, 1934-2018.
Dryodurgades antoniae (Melichar, 1907)
VC63: rare, Broom *Cytisus scoparius*, 2015-2017.

Subfamily APHRODINAE Haupt, 1927

Anoscopus albifrons (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: frequent, grasses, 1956-2017.

Anoscopus albiger (Germar, 1821)

VC61, VC63: rare, grasses, 1974-2007.

Anoscopus flavostriatus (Donovan, 1799)

VC61, VC62, VC63, VC64, VC65: scarce, grasses, 1957-2016.

Anoscopus histrionicus (Fabricius, 1794)

VC61, VC62, VC63: rare, grasses, 1975-1986.

Anoscopus serratulae (Fabricius, 1775)

VC62, VC63: rare, grasses, 1964-2014.

Aphrodes bicincta (Schrank, 1776)

VC63: rare, legumes, 2014-2017, 2 records.

Aphrodes makarovi Zakhvatkin, 1948

VC61, VC62, VC63, VC64, VC65: common, dandelions, Nettle, thistles, 1957-2018.

Planaphrodes bifasciatus (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: scarce, moorland grasses, 1956-1998.

Planaphrodes trifasciatus (Geoffroy in Fourcroy, 1785)

VC62, VC63, VC64: rare, Heather *Calluna vulgaris*, 1965-1990.

Stroggylocephalus livens (Zetterstedt, 1838)

VC63: rare, sedges, 1990-2006, 2 records.

Subfamily CICADELLINAE Latreille, 1825

Cicadella viridis (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: common, rushes and sedges, 1957-2018.

Graphocephala fennahi Young, 1977

VC61, VC63, VC64: scarce, rhododendrons, 2004-2018.

Subfamily EUPELICINAE Sahlberg, 1871

Eupelix cuspidata (Fabricius, 1775)

VC61, VC62, VC63, VC64: frequent, grasses, 1926-2018.

Subfamily EVACANTHINAE Metcalf, 1929

Evacanthus acuminatus (Fabricius, 1794)

VC62, VC63, VC64, VC65: scarce, polyphagous, 1931-2017.

Evacanthus interruptus (Linnaeus, 1758)

VC61, VC62, VC63, VC64, VC65: common, polyphagous, 1931-2018.

Subfamily IDIOCERINAE Baker, 1915

Acericerus heydenii (Kirschbaum, 1868)

VC63: scarce, Sycamore *Acer pseudoplatanus*, 2014-2019.

Acericerus ribauti Nickel & Remane, 2002

VC63: rare, Field Maple *Acer campestre*, 2014-2019.

Acericerus vittifrons (Kirschbaum, 1868)

VC62, VC63: scarce, Field Maple, 2014-2018.

Idiocerus herrichii Kirschbaum, 1868

VC61, VC63: scarce, White Willow *Salix alba*, 2002-2018.

Idiocerus lituratus (Fallén, 1806)

VC61, VC62, VC63, VC64, VC65: frequent, willows, 1934-2018.

Idiocerus similis Kirschbaum, 1868

VC62, VC63, VC64: rare, Purple Osier *Salix purpurea*, 1960-1996, unverified records.

Idiocerus stigmaticalis Lewis, 1838

VC61, VC62, VC63, VC64: frequent, willows, 1924-2018.

Metidiocerus elegans (Flor, 1861)

VC61, VC62, VC63, VC64, VC65: uncommon, willows, 1954-2014.

Metidiocerus rutilans (Kirschbaum, 1868)

VC61, VC62, VC63: scarce, willows, 1984-2018.

Populicerus albicans (Kirschbaum, 1868)

VC61, VC62, VC63, VC64: uncommon, White Poplar *Populus alba*, 1943-2017.

Populicerus confusus (Flor, 1861)

VC61, VC62, VC63, VC64, VC65: common, willows, 1931-2018.

Populicerus laminatus (Flor, 1861)

VC61, VC62, VC63, VC64: scarce, Aspen *Populus tremula* , 1935-2017.

Populicerus nitidissimus (Herrich-Schaeffer, 1835)

VC61, VC62, VC63: scarce, Black Poplar *Populus nigra*, 1975-2018.

Populicerus populi (Linnaeus, 1761)

VC61, VC62, VC63, VC64, VC65: frequent, Aspen, 1935-2018.

Rhytidodus decimusquatus (Schrank, 1776)

VC61, VC62, VC63: scarce, Lombardy Poplar *Populus italica*, 1965-2018.

Stenidiocerus poecilus (Herrich-Schaeffer, 1835)

VC61, VC63: scarce, Lombardy Poplar, 1968-2017.

Tremulicerus distinguendus (Kirschbaum, 1868)

VC61, VC63, VC64: uncommon, White Poplar, 1957-2017.

Tremulicerus fulgidus (Fabricius, 1775)

VC61, VC63: scarce, Lombardy Poplar, 1992-2018.

Tremulicerus tremulae (Estlund, 1796)

VC61, VC62, VC63, VC64: scarce, Aspen, 1956-2018.

Tremulicerus vitreus (Fabricius, 1803)

VC61, VC62, VC63: uncommon, Black Poplar, 1965-2018.

Viridicerus ustulatus (Mulsant and Rey, 1855)

VC61, VC63: scarce, White Poplar, 2006-2016.

Subfamily IASSINAE Amyot & Serville, 1843

Batracomorohus irroratus Lewis, 1838

VC61, VC62: rare, Common Rock Rose *Helianthemum nummularium*, 1935-1993.

Iassus lanio (Linnaeus, 1761)

VC61, VC62, VC63, VC64, VC65: frequent, oaks, 1930-2018.

Iassus scutellaris (Fieber, 1868)

VC61: rare, elms, 2011, single record.

Subfamily MACROPSINAE Evans, 1935

Macropsis albae Wagner, 1950

VC61, VC63: rare, White Willow, 1984-2018.

Macropsis cerea (Germar, 1836)

VC61, VC62, VC63, VC64, VC65: uncommon, willows, 1954-2018.

Macropsis fuscinervis (Boheman, 1845)

VC61, VC63: rare, Aspen, 1979-2007.

Macropsis fuscula (Zetterstedt, 1828)

VC61, VC62, VC63: scarce, brambles, 1974-2016.

Macropsis glandacea (Fieber, 1868)

VC61: rare, elms, 2007, single record.

Macropsis graminea (Fabricius, 1798)

VC63: rare, Black Poplar, 1986-2016.

Macropsis impura (Boheman, 1847)

VC61, VC62, VC65: rare, Creeping Willow *Salix repens*, 1927-1935.

Macropsis infuscata (J. Sahlberg, 1871)

VC63: rare, Goat Willow *Salix caprea*, 1979-2014.

Macropsis marginata (Herrich-Schaeffer, 1836)

VC61, VC63, VC64: rare, Purple Osier, 1963-2016.

Macropsis prasina (Boheman, 1852)

VC61, VC63, VC64, VC65: uncommon, willows, 1937-2017.

Macropsis scotti Edwards, 1920

VC61, VC63: scarce, brambles, 1975-2017.

Macropsis scutellata (Boheman, 1845)

VC61, VC62, VC63: uncommon, Nettle *Urtica dioica*, 1978-2017.

Oncopsis alni (Schrank, 1801)

VC61, VC62, VC63, VC64, VC65: uncommon, Alder, 1927-2017.

Oncopsis appendiculata Wagner, 1944

VC63: rare, Silver Birch, 2018, single record.

Oncopsis avellanae Edwards, 1920

VC61, VC62, VC63, VC64, VC65: uncommon, Hazel, 1978-2000.

Oncopsis carpini (J. Sahlberg, 1871)

VC62, VC63: rare, Hornbeam *Carpinus betulus*, 1981-1996.

Oncopsis flavicollis (Linnaeus, 1761)

VC61, VC62, VC63, VC64, VC65: common, Silver Birch, 1931-2017.

Oncopsis subangulata (J. Sahlberg, 1871)

VC61, VC62, VC63, VC64, VC65: scarce, Silver Birch, 1957-2012.

Oncopsis tristis (Zetterstedt, 1840)

VC61, VC62, VC63, VC64, VC65: frequent, Silver Birch, 1931-2017.

Pediopsis tiliae (Germar, 1831)

VC62, VC63: rare, Small Leaved Lime *Tilia cordata*, 1982-1987, 3 records.

Subfamily MEGOPHTHALMINAE Kirkaldy, 1906

Megophthalmus scabripennis Edwards, 1915

VC61, VC62, VC63: scarce, trefoils, 1962-2016.

Megophthalmus scanicus (Fallén, 1806)

VC61, VC62, VC63, VC64, VC65: uncommon, trefoils, 1925-2018.

Family: ULOPIDAE Le Peletier & Servile, 1825 (planthoppers)

Ulopa reticulata (Fabricius, 1794)

VC61, VC62, VC63, VC64, VC65: frequent, Heather, 1929-2014.

Taxonomic Changes since Le Quesne & Payne (1981) and adopted herein:

AGALLIINAE:

Anaceratagallia venosa (Fallén, 1806)

Dryodurgades antoniae (Melichar, 1907)

APHRODINAE:

Aphrodes albifrons (Linnaeus, 1758) is now *Anoscopus albifrons* (Linnaeus, 1758).
Aphrodes albiger (Germar, 1821) is now *Anoscopus albiger* (Germar, 1821).
Aphrodes flavostriatus (Donovan 1799) is now *Anoscopus flavostriatus* (Donovan 1799).
Aphrodes histrionicus (Fabricius, 1794) is now *Anoscopus histrionicus* (Fabricius, 1794).
Aphrodes serratulae (Fabricius, 1775) is now *Anoscopus serratulae* (Fabricius, 1775).
Aphrodes bifasciatus (Linnaeus, 1758) is now *Planaphrodes bifasciatus* (Linnaeus, 1758).
Aphrodes trifasciatus (Geoffroy in Fourcroy, 1785) is now *Planaphrodes trifasciatus* (Geoffroy in Fourcroy, 1785).

IDIOCERINAE:
Acericerus heydenii (Kirschbaum, 1868) is new to Britain.
Acericerus ribauti Nickel & Remane, 2002 is new to Britain.
Idiocerus vittifrons Kirschbaum, 1868 is now *Acericerus vittifrons* (Kirschbaum, 1868).
Idiocerus elegans Flor,1861 is now *Metidiocerus elegans* (Flor, 1861).
Idiocerus rutilans Kirschbaum, 1868 is now *Metidiocerus rutilans* (Kirschbaum, 1868).
Idiocerus albicans Kirschbaum, 1868 is now *Populicerus albicans* (Kirschbaum, 1868).
Idiocerus confusus Flor, 1861 is now *Populicerus confusus* (Flor, 1861)
Idiocerus laminatus Flor, 1861 is now *Populicerus laminatus* (Flor, 1861).
Idiocerus nitidissimus (Herrich-Schaeffer, 1835) is now *Populicerus nitidissimus* (Herrich-Schaeffer, 1835).
Idiocerus populi (Linnaeus, 1761) is now *Populicerus populi* (Linnaeus, 1761).
Idiocerus poecilus (Herrich-Schaeffer, 1835) is now *Stenidiocerus poecilus* (Herrich-Schaeffer, 1835).
Idiocerus distinguendus Kirschbaum, 1868 is now *Tremulicerus distinguendus* (Kirschbaum, 1868).
Idiocerus fulgidus (Fabricius, 1775) is now *Tremulicerus fulgidus* (Fabricius, 1775).
Idiocerus tremulae (Estlund, 1796) is now *Tremulicerus tremulae* (Estlund, 1796).
Idiocerus vitreus (Fabricius, 1803) is now *Tremulicerus vitreus* (Fabricius, 1803).
Viridicerus ustulatus (Mulsant and Rey, 1855) is new to Britain.

MACROPSINAE:
Macropsis mendax (Fieber, 1868) is now *Macropsis glandacea* (Fieber, 1868).

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A list of some British species and selected photographs can be viewed at: https://www.britishbugs.org.uk/gallery.html

Erratum

In Redshaw, P. (2019) The Lady's-slipper Orchid in 1930: a family secret revealed (*The Naturalist* 144: 165-170): in Fig.1 (p165) Richard Jarman died around 1970, not 1960 and Annie Jarman in 1996 not 1906; on p168 William Jarman died in 1971 not 1972; in Acknowledgements Peter Shelby should be Richard Shelby.

Drystone walls and lichenivorous moths in the Yorkshire Dales: some preliminary fndings

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Introduction

Drystone walls provide a habitat for numerous flowering plants, ferns, lichens and mosses. These man-made structures also provide a habitat for invertebrates such as snails, spiders, and woodlice as well as caterpillars. Hidden under the stones the larvae of the Common Footman *Eilema lurideola* and Muslin Footman *Nudaria mundana* moths are commonly found (for adults see Figure 1, p20).

The caterpillars of both moths can be found living in the same walls and often on the undersides of the same stones (see Figure 2 p20). They can be easily identified by their distinct colouration and there is no attempt at camouflage. The Common Footman larva is the larger of the two (reaching 23-26mm in length when full-grown) with the Muslin Footman ranging from 12 to 15mm. Both are widely distributed throughout England (National Biodiversity Network). Muslin Footman larvae have been found feeding on lichen, algae and mosses on rough scree, quarries, walls, fence posts and shrubs (UK Moths website). Common Footman larvae also feed on lichen and algae growing on a wide range of substrates but have also been found on the

Figure 1. Adult moths: Muslin Footman (left) and Common Footman (right).
Photos: Dave Williamson

leaves of hawthorns, Blackthorn *Prunus spinosa*, Traveller's-joy *Clematis vitalba* and brambles (Allan, 1949). Thus both moths, whilst feeding on lichens and algae, are not restricted to plants growing on drystone walls.

In Yorkshire both have been recorded on the wing from June to August with the caterpillars being found from March to September (Common Footman) and May to July (Muslin Footman). However, there are few records for the larvae. For example, in VC65 there are combined records of 938 adults and just 6 caterpillars (www.yorkshiremoths.info). Once the eggs have been laid the immature moths overwinter and then pupate in the late spring or early summer. It is not clear whether the caterpillars of either species experience a diapause over the winter or whether they continue feeding.

The aim of the study was to survey the caterpillars found in drystone walls to establish their distribution in the Yorkshire Dales National Park, possible factors influencing this distribution and to provide further information regarding their life cycles.

Survey

The initial survey started in May 2018 using the same walls as those studied in earlier surveys (Pearson, 2016). The number of caterpillars found at ten points over a one hundred meter section of wall was recorded.

Figure 2. A stone from a study wall showing large numbers of Muslin Footmen caterpillars, together with one Common Footman larva at top right (shown in inset below). *M.Pearson*

Unfortunately, before the survey could be completed, the number of caterpillars crashed, possibly due to early pupation and the unusually warm weather. This survey was abandoned and attention was focused on a single wall throughout the rest of the year and into the spring. The survey was resumed in 2019 with a total of 69 drystone walls being examined between April and May.

Results

In the wall survey a total of 954 caterpillars were recorded with a mean of nearly 14 per wall. In 10 walls (14%) there were no sightings and yet in a single wall, near Hawes, there were 113 Muslin Footman larvae with 62 of these under a single stone. 52% of the walls contained both species of moth whilst 25% contained only the Muslin Footman and 9% only the Common.

Table 1. The distribution of Muslin and Common Footman caterpillars on drystone walls

	Muslin Footman Mean per wall	Common Footman Mean per wall
Muker	3.0	0.2
Hawes	12.5	1.6
Conistone	24.2	4.0
Upper Wharfedale	6.0	1.8
Malham	9.8	1.9
Austwick	13.4	6.0
Winskill	3.8	1.5

Table 1 is a summary of the geographical distribution of the caterpillars. The Muslin Footman was recorded in the highest density at Conistone with the least in the walls at Muker. In the case of the Common Footman the lowest numbers were also found at Muker but the highest were found around Austwick. For each species there was considerable variation in numbers geographically.

Are these distributions mere chance or are there reasons for a preference for certain drystone walls? As with previous surveys the walls were divided into three categories according to the geology of the rock: those composed of limestone, non-limestone (siliceous) and mixed (both acid and basic stone). Table 2 is a summary of the number of larvae found in the walls of differing geology. The first point to note is that the Common Footman is far less common than the Muslin Footman. The least number of both species were recorded in non-limestone walls yet there was no clear evidence that both species preferred the limestone walls. The Common Footman was found in slightly higher numbers in the limestone but many more of the Muslin Footman larvae were found in the mixed geology walls. Perhaps more lichens, whether number of species or coverage, live on walls of mixed geology compared to those built solely of siliceous stone.

Table 2. The distribution of Footman caterpillars according to the geology of the drystone walls.

	Muslin Footman	Common Footman	Total
Limestone	288	112	400
Mixed	410	93	503
Non-limestone	26	25	51
Total	724	230	954

The data were analysed to investigate whether there is a correlation between the number of caterpillars and the altitude of the walls. The Pearson correlation coefficient (r) for the Muslin Footman was -0.22 which was only just not statistically significant (p=0.07). For the Common Footman r = -0.38 which was highly significant (p=0.001). In other words fewer caterpillars of the Common Footman were found on walls at higher altitudes.

When the 2018 survey was abandoned attention was focused on studying the walls at Townhead Lane in Austwick to identify which lichens the caterpillars were feeding on and to discover more about the moths' life cycles. As the larvae are nocturnal this posed several problems. It was difficult to identify the lichens on which the caterpillars were found, even with a torch and hand lens. It was even harder to find evidence of grazing damage to the lichens. In other words it is not enough to show that a caterpillar is on an identifiable lichen but that the larva is also feeding on it. All that could be concluded was that both moths tended to be found on either crustose lichens (for example *Lecanora gangaleoides*) or on stone with an algal crust (*Pleurococcus*).

Both species were found up to the end of October, though they were not always on the surface of the stone. Throughout November and the following winter months neither species was found. By early April they were once again on the wall surface, on both acidic and basic rocks, though more larvae were found on the acid stone. The Common Footman was more frequent until the middle of May and the Muslin Footman increased in numbers thereafter. By the summer solstice just a single Muslin Footman caterpillar was found and by the beginning of July no larvae were seen. Throughout the survey neither eggs nor pupae were recorded.

Discussion

There are over twenty species of macromoths in Britain whose larvae are known to feed on lichen and algae (Porter, 1997). Of these only the Muslin, Dingy, Buff and Common Footman as well as the Marbled Beauty have been recorded in the Yorkshire Dales. Thus only two of these species appear to have colonised drystone walls in the area.

Despite its name, the Common Footman caterpillars were not as frequently found in this survey as the Muslin Footman. Overall there were three times as many Muslin as Common Footman larvae. This is also reflected in trapping of the adult on the Ingleborough NNR. (Whitaker, 2015-18). The annual monitoring reports from 2012 onwards clearly show that more adult Muslin Footman moths were trapped, though there was considerable variation in the ratio both between sites and annually. Overall the Muslin Footman adults were about ten times more frequent than the Common Footman. Buff and Dingy Footman adults were also trapped but in much lower numbers. Other trapping results in nearby Ingleton, at a lower elevation, showed that over a five year period Muslin Footman moths were twice as frequent as the Common Footman (R. Neale, *pers. comm.*). These other surveys of adult moths reflect the geographical variation in the occurrence of the larval forms. Further trapping results over a wider area would be useful to explore this variation further.

When considering the distribution of both moths, for Yorkshire and further afield, the Common Footman is more frequent than the Muslin Footman. While neither species is limited to the flora of walls it may suggest that the Common Footman caterpillars have a broader diet of lichens and algae. In other words the Common Footman may feed on lichens growing on trees, rocks, fence posts etc whilst the Muslin Footman may be more specialist grazers. If this specialism is limited to lichens growing on stone, which is more common than trees in the Yorkshire Dales,

this could explain some of the disparity in their distribution.

There have been very few surveys published of the lichens growing on drystone walls. The earliest was of the walls of Bradgate Park in Leicestershire (Laundon, 1980). A total of 21 species of lichens were on these siliceous walls. The only other survey, of the limestone walls of the Mendips, provided a list of 31 lichens (Betts, 2008). The only lichen common to both surveys was *Lecanora conizoides*, which is often found on trees but is also known to colonise walls (Dobson, 2018). This lack of commonality is because many lichens grow on specific substrates. Thus the Bradgate Park lichens were those typically found on siliceous stone while the Mendip lichens were those usually limited to limestone. In both cases there were some lichens which usually prefer trees or nutrient-enriched sites. It was not clear from the Mendip study whether these lichens were growing on the stone or on woody plants living in the walls.

Finally, for such ubiquitous moths, little is known about the life histories of these two species. Whilst the timings of the stages of their development are similar there was no evidence of eggs or pupae in the walls. Perhaps the eggs are laid deep within the structure or are hidden amongst the lichens. The caterpillars possibly move further into the walls when it is time for them to pupate. Both species have a diapause or dormant period and again may retreat into the walls. It is unlikely that this resting stage is due to lack of food as the lichens are available throughout the winter, though the diapause may be triggered by falling temperatures or a reduction in length of daylight. The increase in day length in the late spring would then result in the continuing development of the larvae (Majerus, 2002). Little is known about how the female moth selects the walls to lay her eggs and whether they are laid singly or in clusters.

Conclusion

In the Yorkshire Dales the drystone walls provide an important habitat for the Muslin and Common Footman moths. The survey has provided considerably more records of the caterpillars than previously available. As an initial study the survey raises more questions than answers. These two moths deserve further study to elucidate more about their life histories and the relationship between the caterpillars and the food they eat.

Acknowledgements

Colin Newlands, of Natural England, for providing copies of Terry Whitaker's annual trapping surveys for the Ingleborough NNR. and Roger Neale for his data from his moth traps.

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A photograph of Yorkshire taxidermy interest

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The accompanying photograph was acquired many years ago, a chance find rescued from unrelated papers. It shows Oxley Grabham (1865–1939) and Philip Loten (1845–1908), the latter holding a mounted Peregrine Falcon *Falco peregrinus*.

Loten was an Easington resident and, located between the Humber and the coast, he became familiar as a local bird man, taxidermist and creator of his own museum. Among the visitors to his show-place he welcomed naturalists, often those heading for the Spurn area. They included Grabham, employed as Keeper of the Yorkshire Museum and himself interested in taxidermy. Today, Grabham is mainly recalled as compiler of the vertebrate sections of the Victoria History of the County of York (1907). In his introduction to the birds, Grabham remarked:

> "Mr. Philip Loten, the well-known bird-stuffer of Easington, near Spurn Point, has probably had more local rarities through his hands than any other man in the county."

Because of its age, the photograph inevitably looks somewhat staged, Grabham with his double-barrelled shotgun and Loten proud of an impressive mount. The pencilled inscription on the reverse offers no clue to the circumstances portrayed, although the date given of June 1908 is to be disregarded. The inscription is initialled "ARH", but it is not known if this was the original photographer. *The Naturalist* featured obituaries of Grabham (65: 77–78) and Loten (33: 239–241). Recently a 64-page book, *Philip Warrener Loten Taxidermist and Museum Creator* (published by SKEALS, 2019), has been compiled by Mike Welton. He has formed an archive of Loten-related images, to which the stray survivor has now been donated. It thus resides where it belongs, in Easington.

I would like to thank Peter Tuffrey for digitally enhancing the fading image for publication.

Field Note: Flamingo Moss mass mortality and regeneration of a small population

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Flamingo Moss *Tortula cernua* is an Endangered moss that grows at only a handful of sites on the Magnesian Limestone of South Yorkshire, north Nottinghamshire and Derbyshire (Blockeel, 2000). It is considered to be Endangered (Hodgetts, 2011) and is strictly protected on Schedule 8 of the Wildlife and Countryside Act 1981. This moss has always been rare and was the subject of careful monitoring between 2000-2006 as part of Plantlife's Back from the Brink project (Hodgetts, 2008).

Attempts to relocate known populations of the moss in the winter of 2018-2019 resulted in an interesting observation for one part of the population at the site known as 'Levitt Hagg trackside' (Heathcote & Blockeel, 2019), a small area of exposed lime kiln waste just to the west of the impressive remains of the 'White Elephant' lime kiln. Here the main population grows on a sloping bank just above the unsurfaced track. However, a subsidiary population is located 100m further west, on a steep-sloping cutting. This has always been a small population, estimated to be around 200 individuals in 2006. However, in January 2019 all vegetative material that could be assigned to Flamingo Moss was dead, and only a few old sporophytes were present (Fig. 1).

Figure 1 (left) shows an area of largely dead Flamingo Moss *Tortula cernua* sporophytes.
Figure 2 (right) shows healthy sporophytes and their characteristically-shaped capsules.
S. Heathcote

The full life-history of this moss is unknown but individual colonies are thought to persist for 'a few years' (Hodgetts, 2008). It reliably produces spores, apparently year-round, which germinate instantly on contact with suitable substrate (Headley, 2006). There are no previous records of a population without any living rosettes (Hodgetts, 2006) so this mass of dead Flamingo Moss was

therefore of some concern. This subsidiary population was revisited in January 2020 to see if any plants had survived or if there had been successful regeneration. Careful searching revealed that not only had the moss survived but it was producing sporophytes. About 20 sporophytes were counted, all associated with both living and senescing rosettes, and additional clusters of vegetative rosettes were also present scattered amongst the more common mosses (Variable Forklet-moss *Dicranella varia* and Olive Beard-moss *Didymodon tophaceus*) (Fig.2, p25).

It seems, then, that 2018 was not a good year for this population of Flamingo Moss, but it has recovered quickly from this. It is perhaps easiest to speculate that, despite the shelter of a Sycamore *Acer pseudoplatanus* canopy and the proximity to the River Don, perhaps the hot, dry weather led to early production of sporophytes and die-off of all plants. Certainly 2019 was wetter and the moss appears to have recovered reasonably well. However, there is no evidence for this and it will be interesting to monitor the population in future to see if similar events are a regular occurrence.

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Notes on the Heleomyzid flies of Cali Heath YWT reserve

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Cali Heath is a small (27 acre), sandy lowland heath reserve of the Yorkshire Wildlife Trust, whose history, habitats and dipteran fauna were detailed by Crossley (2016). At that time, the species list for the reserve was recorded as 479 species from 44 families. By concentrating on collecting flies of families rarely collected by Mr Crossley, that total has now increased to 610 species from 56 families. For such a small reserve, this is a remarkable variety of diptera.

One of the families studied at Cali Heath over recent years has been the Heleomyzidae, a relatively small family of acalyptrate flies with 56 species on the UK list, of which 48 have been recorded in Yorkshire and 24 on the reserve. Their larvae are saprophagous in plant or animal material. Under the microscope or a lens, they are remarkable for a row of obvious spines along the leading edge, the costa, of the wing (see Fig.1, p28). Most of them are small to medium-sized, yellowy-brown or grey flies of a skulking nature, and so do not readily catch the eye of

the general entomologist. The lack of a published key and reliable photographs, added to their peak appearance late in the season when many entomologists have already hung up their nets, has meant that most dipterists do not spend a lot of time on them. However, different species within the family have close associations with fungi, dung, carrion and animal burrows and so they are an interesting group to study.

Suillinae, Heleomyzinae and Heteromyzinae make up the three subfamilies within the Heleomyzidae and each has representatives at Cali Heath. The Suillinae are represented by the single genus *Suillia*, yellowish-brown flies associated mainly with fungi. They are distinguished by the lack of a humeral bristle and only having a single orbital bristle on the frons. All ten of the *Suillia* species found so far on the reserve lurk in the shadows beneath the oaks and alders, especially around ferns. Having a strong association with fungi, they generally are most obvious in late autumn, but *Suillia affinis,* one of the species with extensive dark shading on the wings, can be found right through the winter on mild days and is the species most likely to be noticed sitting prominently on bramble leaves and fence posts. When fungi are at their prime in late autumn, the smaller *Suillia bicolor* is abundant on and around a variety of fungi. The other eight species of *Suillia* are less obvious, but all can be swept from ferns at their different times.

The Heteromyzinae are made up of eight small species, characterised by a prominent bristle on the gena beneath the eye and a single ventral preapical seta on the mid tibia. They all have a grey thorax and an orange abdomen, and three species have been found at Cali Heath. *Tephrochlamys rufiventris,* a very common species, and *Tephrochlamys tarsalis* both come readily to bottle traps baited with pig's kidney, though the former can be swept around the reserve throughout the year. The other, *Tephrochlaena oraria,* is normally a species of the coast, thought to breed within rotting seaweed, but has turned up twice on the reserve in March - whether established on the reserve or just adventive as part of the aerial plankton needs confirming, though the sandy substrate may well be to its liking.

The subfamily Heleomyzinae, characterised by the lack of an obvious bristle on the gena and by the presence of two preapical ventral setae on the mid tibia, has some interesting species associated with carrion and with subterranean habitats; the extensive rabbit warrens at Cali Heath provide for both of those. *Neoleria ruficauda*, once removed from the Yorkshire list due to possible confusion with *N. ruficeps* (details in Grayson, 2019), has proved recently to be abundant locally on carrion including Mallard *Anas platyrhyncos*, Roe Deer *Capreolus capreolus* (see Fig.4, p28), Badger *Meles meles* and Rabbit *Oryctolagus cuniculus*. A Badger found dead on the reserve, apparently hit by a car overnight on 8 February 2019, was first visited by a single male *N. ruficauda* 37 days post mortem, but that quickly increased to 20 males by 41 days and the species in variable numbers was then to be found daily, until last recorded on the Badger 125 days post mortem, by which time the corpse was largely reduced to fur and just a few bones remaining above ground. Males were often seen lekking around the corpse, with mating then taking place on elevated leaves and branches within a two metre radius around the corpse and occasionally on the corpse itself. Females were seen disappearing beneath the corpse, presumably for egg laying. The nationally notable *Neoleria propinqua* also appeared on the same Badger; it is very similar to *ruficauda* in appearance, but males have a small peg beneath the hind basitarsus and subtly different thoracic markings. In January 2020 several males also turned up in a bottle trap baited with chicken livers.

A species pair found regularly on Rabbit corpses, which are not infrequent around the reserve, is *Heleomyza serrata/captiosa*. These will often be found alongside *Nicrophorus* burying beetles and seen to emerge from cavities within the corpse. There has been much confusion in the past over the separation of this pair and further work perhaps needs to be done to determine the reliability of differentiation through details within the male genitalia. It appears that *serrata* is the normal species found, but males taken from a Rabbit in 2016 were confirmed by Andrzej Woźnica, a Polish expert on Heleomyzids, as *captiosa*, and specimens taken from the badger corpse mentioned above keyed out to both species, so it is now certain that both species are found on the reserve.

Figure 1 (top left). A wing of *Suillia ustulata*, showing the strong spines along the costal margin, typical of Heleomyzid flies.

Figure 2 (top right). A funnel trap placed over a disused entrance to a rabbit burrow in order to catch flies emerging from within the burrow.

Figure 3 (left). The head of *Oecothea fenestralis* to illustrate the small eyes and long antennal aristae of species living within animal burrows.

Figure 4 (bottom left). *Neoleria ruficauda* male on the bloated eyeball of a dead Roe Deer.

All photos by I.Andrews

Sweeping around the entrance to Rabbit burrows has produced records of three rarely recorded species. A single male of *Eccoptomera longiseta,* new to VC61, was taken on 1 June 2018 and females of *Eccoptomera obscura* on 29 October and 10 November 2019. The latter are first records for Yorkshire. *Eccoptomera* are similar in build to a third species, *Oecothea fenestralis**. They all have rather small eyes and long aristae on the antennae (see Fig.3, p28); certainly in the case of *Oecothea*, and doubtless *Eccoptomera* as well, appropriate to their living partly underground. Several *Oecothea* have been caught in December 2019 in a funnel trap placed over disused rabbit holes (see Fig.2, p28)and around 3m down a burrow from the exit hole in use. This tychocoenic lifestyle, largely subterranean but with time spent above ground as well, would be worth following up with other members of the Heleomyzinae. *Scoliocentra villosa*, for example, an attractive orange and grey species with a dense covering of hairs across its body, has also been swept from the entrance to burrows here and may also have larvae which breed within them. Of interest, another similar species, *Eccoptomera microps*, is probably eucoenic within the burrow system of Moles, spending the majority of its lifecycle below ground. It could well be present on the reserve, but has not been found so far.

It is quite likely that one or two more species will be found on the reserve in the future, but already the Heleomyzid fauna of such a small reserve is exceptional and is yet another example of the first rate entomological interest of the site.

* There are two UK species of *Oecothea*, (*fenestralis* and *praecox*) and their separation (based upon relative depths of gena against eye) is in need of clarification. Collin (1943) refers to *praecox* being taken from rabbit burrows and *fenestralis* being taken usually on windows, but evidence from continental Europe suggests that *praecox* may in fact be an obligate species of caves, unlike the more widespread *fenestralis*. The specimens taken at Cali Heath certainly seem to fit better for *fenestralis* and so will be referred to as such, pending developments in taxonomy.

Heleomyzidae species recorded at Cali Heath between 2015 and 2019

Eccoptomera longiseta	*Neoleria ruficauda*	*Suillia laevifrons*
Eccoptomera obscura	*Oecothea fenestralis*	*Suillia notata*
Gymnomus caesius	*Scoliocentra villosa*	*Suillia pallida*
Heleomyza captiosa	*Suillia affinis*	*Suillia ustulata*
Heleomyza serrata	*Suillia atricornis*	*Suillia variegata*
Heteromyza rotundicornis	*Suillia bicolor*	*Tephrochlaena oraria*
Morpholeria ruficornis	*Suillia fuscicornis*	*Tephrochlamys rufiventris*
Neoleria propinqua	*Suillia humilis*	*Tephrochlamys tarsalis*

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My thanks are due to Officers of the Yorkshire Wildlife Trust for permission to collect at the site and in particular to James Searle for permission to leave traps out and for his interest in the study of diptera at Cali Heath. My thanks also to Andrew Grayson for information on previous Yorkshire records of the Heleomyzidae.

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Yorkshire Ichneumons: Part 11

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Introduction

Yorkshire statuses are taken from the chart shown on the YNU website:

www.ynu.org.uk/insects/parasitic_wasps

† = new county record

* = new vice-county record

Subfamily **TRYPHONINAE**

Additions to Ely, 2015a:

Tribe ***Phytodietini***

Phytodietus (Phytodietus) astutus Gravenhorst, 1829. Scarce in Yorkshire.

*VC61: Field Lane, Thornton 9.6.2016 R.Crossley.

Tribe ***Oedomopsini***

Neliopisthus elegans (Ruthe, 1855). Rare in Yorkshire.

*VC63: St Ives, Keighley 12.8.1944 J.Wood (det. W.D.Hincks, W.A.Ely).

Tribe ***Tryphonini***

Polyblastus (Labroctonus) melanostigmus Holmgren, 1857. Rare in Yorkshire.

*VC63: Colden Valley 1.8.1947 J.Wood.

Subfamily **BANCHINAE**

Additions to Ely, 2018a:

Lissonota (Campocineta) proxima Fonscolombe, 1854. Scarce in Yorkshire.

*VC64: Sunnyside nr Keighley 17.9.1949 J.Wood.

Cryptopimpla errabunda (Gravenhorst, 1829). Rare in Yorkshire.

*VC64: Hollins Hill, Baildon 17-20.8.2017 H.N.Whiteley.

Subfamily **CTENOPELMATINAE**

Amendment and addition to Ely, 2018b:

One of the unconfirmed reports of ***Absyrtus vicinator*** (Thunberg, 1824) from VC63 in Hincks (1953a) p38 is based on a specimen in the Manchester Museum collection which has now been re-examined; it belongs to ***Perilissus albitarsis*** Thomson, 1883.

Mesoleius pyriformis (Ratzeburg, 1852). Scarce in Yorkshire.

*VC62: Buttercrambe Woods 22.6.1935 J.Wood.

Phobetes atomator (Müller, 1776). Rare in Yorkshire.

*VC62: Dalton Lane, Dalton Bridge 2.9.2011 W.A.Ely.

Subfamily **CAMPOPLEGINAE**

Additions to Ely, 2019:

Casinaria mesozostus Gravenhorst, 1829. Rare in Yorkshire.

*VC63: Bolster Moor, Huddersfield 5.8.2019 C.Rew.

Campoplex punctulatus (Szépligeti, 1916). Rare in Yorkshire.

*VC64: Hollins Hill, Baildon 17-20.8.2017 H.N.Whiteley.

Dusona erythrogaster (Förster, 1868). Rare in Yorkshire.

*VC64: Hetchell Wood YWT NR 11.6.1988 W.A.Ely.

Subfamily **CREMASTINAE**

Cremastus geminus Gravenhorst, 1829. Rare in Yorkshire.

Recorded from VC62 in Ely (2013b) p237.

*VC63: Rockcliffe Road, Rawmarsh 2.6.2013 P.Leonard.

*VC65: Gill Wood 4.10.1985 W.A.Ely.

Cremastus infirmus Gravenhorst, 1829. Rare in Yorkshire.

Unconfirmed report from VC63 in Ely (2011b) p222. Recorded from VC65 in Ely (2011b) p222.

Cremastus pungens Gravenhorst, 1829.

Unconfirmed report from VC62 in Fordham (1929) p375 and Fitton & Gauld (1980) p69 (as *C. spectator* Gravenhorst, 1829).

Cremastus spectator Gravenhorst, 1829. Rare in Yorkshire.

Recorded from VC61 in Whiteley & Grayson (2018) p228.

Temelucha arenosa (Szépligeti, 1899). New to Yorkshire.

†VC63: Marley 15.10.1947 J.Wood.

Temelucha interruptor (Gravenhorst, 1829). Rare in Yorkshire.

†VC63: The Canyon, Catcliffe 9.7.1993 W.A.Ely.

*VC65: Nosterfield NR 1.7.2011 C.H.Fletcher,J.C.Warwick.

Pristomerus vulnerator (Panzer, 1799). Rare in Yorkshire.

†VC62: Haxby 23.7.2012 T.J.Crawford.

*VC63: Coniston Avenue, Dalton 10.6.2014 G.Boyd.

The YNU records of Cremastinae have been compiled as follows:

Decade	Species	Records	Records/Species	Collectors
1900-1909	1	1	1	1
1910-1919	1	1	1	1
1920-1929	1	1	1	1
1940-1949	1	1	1	1
1980-1989	1	1	1	1
1990-1989	1	1	1	1
2000-2009	1	2	2	1
2010-2019	5	8	1.6	7

Subfamily **TERSILOCHINAE**

Astrenis nigrifacies Vickberg, 2000. Rare in Yorkshire.
Recorded from VC63 in Ely (2014b) p44.
*VC61: Wilson's Plantation, Limefield Farm, Stamford Bridge 8-15.7.2003 S.E.M.Fraser.

Astrenis paradoxus (Schmiedeknecht, 1907). Rare in Yorkshire.
Recorded from VC63 in Ely (2014b) p44.

Astrenis sinuatus (Roman, 1909). Rare in Yorkshire.
Recorded from VC63 in Ely (2014b) p44.
*VC61: Wilson's Plantation, Limefield Farm, Stamford Bridge 5-12.8.2003 S.E.M.Fraser.

Pygmaeolus nitidus (Bridgman, 1889). Uncommon in Yorkshire.
Recorded from VC63 and VC64 in Ely (1991b) p150.
*VC61: Sewerby Hall 4.6.2011 W.A.Ely.
*VC62: Cat Babbleton 22.6.1985 W.A.Ely.
*VC65: Birk Gill, Colsterdale 7.7.1984 W.A.Ely.

Phrudus defectus Stelfox, 1966. Uncommon in Yorkshire.
Recorded from VC62 and VC63 in Flint (1989) p142 and from VC64 in Ely (2013a) p227.
*VC61: Wilson's Plantation, Limefield Farm, Stamford Bridge 13-20.5.2003 S.E.M.Fraser.

Phrudus monilicornis (Bridgman, 1886). Scarce in Yorkshire.
Recorded from VC61 in Ely (2012c) p234 and from VC65 in Newbould, J.A., Norris, A. & Ely, W.A. (2013) p57.
*VC62: Dother Pits, Runswick Bay 9.6.1990 W.A.Ely.
*VC63: Packman's Bridge Marsh 31.7.1980 W.A.Ely.
*VC64: Leeds city 31.8.1945 W.D.Hincks.

Phradis brevis (Brischke, 1880). Scarce in Yorkshire.
*VC62: Low Mill, Bilsdale 15.6.2013 W.A.Ely.
†VC63: Langold Holt 14.7.1984 W.A.Ely.
*VC64: Cattall 28.4.2014 W.A.Ely.

Phradis interstitialis (Thomson, 1889). Frequent in Yorkshire.
Recorded from VC63 in Beardsmore & Ely (1986) p12 .
*VC61: Buttercrambe Woods 10 + 31.?.1944 J.H.Elliott.
*VC62: Malton Road, York 7 + 13 + 14.5.1944 J.H.Elliott.
*VC64: Adel Dam YWT NR 14.7.2007 L.J.Cuthbert.
*VC65: North Cowton 10.6.2012 W.A.Ely.

Phradis minutus (Bridgman, 1889). Rare in Yorkshire.
*VC61: Pulfin Bog YWT NR 26.6.1988 W.A.Ely.
*VC62: Scarborough landslip 28.5.2011 R.S.Key, A.Norris.
†VC63: Lindrick GC 10.6.1987 W.A.Ely.

Phradis morionellus (Holmgren, 1860). Rare in Yorkshire.
Unconfirmed report from VC62 in Walsh & Rimington (1956) p279.
†VC63: Nor Wood, Roche Abbey 26.6.1986 S.J.Hayhow.
Phradis nigritulus (Gravenhorst, 1829). Rare in Yorkshire.
Recorded from VC63 in Ely (2014b) p44.
Phradis polonicus Horstmann, 1981. Scarce in Yorkshire.
Recorded from VC64 in Ely (1989) p149.
*VC61: Stockingdale 23.6.1983 W.A.Ely.
*VC63: Walkworth Wood 15.5.1986 W.A.Ely.
*VC65: Langton Wood, Northallerton 9.6.2011 W.A.Ely, M.McKerchar.
Phradis rufiventris Horstmann, 1981. Rare in Yorkshire.
*VC61: Shiptonthorpe 5.9.2013 W.A.Ely.
*VC62: Kirkleavington 15.6.2013 W.A.Ely.
†VC63: Revel Wood, Whiston 2.6.1988 W.A.Ely.
Sathropterus pumilus (Holmgren, 1860). Rare in Yorkshire.
*VC61: Dalton Hall 2.6.2011 W.A.Ely.
†VC63: Woodsetts 10.8.2002 W.A.Ely.
Diaparsis (Diaparsis) carinifer (Thomson, 1889). Scarce in Yorkshire.
*VC61: Towthorpe 26.5.1990 W.A.Ely.
*VC62: Crabtree Turn nr Stokesley 17.6.2012 W.A.Ely.
†VC63: Brookhouse 28.6.1978 M.Crittenden, D.W.Twigg.
*VC64: Mitton Bridge, Great Mitton + Ayxa Farm verge 23.6.2013 W.A.Ely.
*VC65: North Cowton 10.6.2012 W.A.Ely.
Diaparsis (Diaparsis) multiplicator Aubert, 1969. Rare in Yorkshire.
†VC61: Cali Heath YWT NR 6.2012 R.Crossley.
Aneuclis melanaria (Holmgren,1860). Rare in Yorkshire.
*VC61: Thornton 25.8.2015 R.Crossley.
*VC62: Snargate 2.9.2011 W.A.Ely.
†VC63: Crow Wood, Finningley 5.9.1977 P.Skidmore.
Epistathmus crassicornis Horstmann, 1971. Rare in Yorkshire.
Recorded from VC62 in Smith (1989) p74 and Ely (2013b) p237.
*VC63: Newsholme Dene 5.8.1949 J.Wood.
Barycnemis agilis (Holmgren, 1860). Rare in Yorkshire.
Recorded from VC65 in Ely (2015c) p237.
Barycnemis bellator (Müller, 1776). Rare in Yorkshire.
*VC62: Staindale 23.8.1987 W.A.Ely.
†VC65: Colsterdale 30.8.1980 W.A.Ely.
Barycnemis dissimilis (Gravenhorst, 1829).
Unconfirmed report from VC62 in Morley (1915) p30.
Barycnemis exhaustator (Fabricius, 1798). Rare in Yorkshire.
Unconfirmed report from VC62 in Anon (1877) p38.
†VC63: Bentley Common 23.9.1976 P.Skidmore.
Barycnemis gravipes (Gravenhorst, 1829).
Unconfirmed report from VC62 in Roebuck (1877) p38 and (1907) p214.
Barycnemis harpura (Schrank, 1802). Frequent in Yorkshire.
Unconfirmed report from VC62 in Roebuck (1877) p38 and (1907) p214 and Morley (1915) p33.
Recorded from VC65 in Ely (1988) p162.
*VC61: Painthorpe 21.6.1980 W.A.Ely.
*VC62: Haxby 1.7.2015 T.J.Crawford.

*VC63: Dungeon Wood, Northcliffe GC, Saltaire 6.1918 G.H.Rhodes.
*VC64: Sharp Hill, Drax 21.7.1987 W.A.Ely.

Probles (Microdiaparsis) microcephalus (Gravenhorst, 1829). Scarce in Yorkshire.
Recorded from VC65 in Newbould, J.A., Norris, A. & Ely, W.A. (2013) p57.
*VC61: Many Gates Plantation, Limefield Farm, Stamford Bridge 4-11.9.2003 S.E.M.Fraser
. *VC62: Ellerburn Bank YWT NR 4-8.7.2011 P.J.Mayhew.
*VC63: Old Lindholme Moor, Hatfield Moor NNR 8-29.8.1990 D.Heaver.
*VC64: Grass Wood YWT NR 3.9.1988 W.A.Ely.

Probles (Microdiaparsis) neoversutus (Horstmann, 1967). Scarce in Yorkshire.
*VC62: Westerdale 18.8.2012 W.A.Ely.
†VC63: Barley Hall colliery site 11.9.1991 W.A.Ely.
*VC64: Hollins Hill, Baildon 10.2013 + 26-28.8 + 1-6 + 28-30.9 + 10-17.10.2015 H.N.Whiteley.

Probles (Euporizon) marginatus (Bridgman, 1886). Scarce in Yorkshire.
*VC61: Skerne 25.8.2011 W.A.Ely.
†VC62: East Row Plantation, Mulgrave Woods 15.9.1990 W.A.Ely.
*VC63: Lindrick GC 9.6.2001 + 7.9.2002 W.A.Ely.
*VC64: Hollins Hill, Baildon 4-9.10.2015 H.N.Whiteley.

Probles (Euporizon) rufipes (Holmgren, 1860). Rare in Yorkshire.
†VC63: Folds Wood, Sandbeck Park 13.6.2003 W.A.Ely

Probles (Euporizon) truncorum (Holmgren, 1860). Rare in Yorkshire.
†VC63: Lindrick Dale Quarry 8.7.1984 W.A.Ely.

Probles (Rugodiaparsis) crassipes (Thomson, 1889). Rare in Yorkshire.
†VC64: Malham Tarn Fen NT 28.7-6.8.2013 P.W.H.Flint, S.Flint.

Probles (Probles) erythrostomus (Gravenhorst, 1829). Rare in Yorkshire.
*VC62: Cass Plantation 9.10.2011 W.A.Ely.
†VC63: Wales fields 21.9.1985 W.A.Ely.
*VC65: Rake Beck 4.10.1985 I.F.G.McLean.

Probles (Probles) flavipes (Szépligeti, 1899). Rare in Yorkshire.
†VC65: Arkengarthdale, The Disputes 24.8.2014 W.A.Ely.

Tersilochus (Gonolochus) caudatus (Holmgren, 1860). Rare in Yorkshire.
†VC63: Valley Plantation, Darrington 20.5.2014 W.A.Ely.

Tersilochus (Pectinolochus) heteroceras (Thomson, 1889). Scarce in Yorkshire.
Recorded from VC62 in Ely (1991a) p146 and from VC63 in Beardsmore & Ely (1986) p12.
*VC61: Towthorpe 26.5.1990 W.A.Ely.

Tersilochus (Pectinolochus) lapponicus Hellén, 1958. Rare in Yorkshire.
*VC61: Cali Heath YWT NR 5.2012 R.Crossley.
*VC63: Lindrick Hill 11.8.1985 W.A.Ely.
*VC64: Cock Beck Wood, Stutton 24.4.2011 W.A.Ely.
†VC65: Leighton Reservoir 3.6.1979 W.A.Ely.

Tersilochus (Pectinolochus) spiracularis Horstmann, 1971. Rare in Yorkshire.
†VC61: Allerthorpe 20.4.1952 J.H.Elliott.
*VC63: Wharncliffe Wood 15.4.1983 A.Brackenbury.

Tersilochus (Pectinolochus) striola Thomson, 1889. Rare in Yorkshire.
*VC61: Cali Heath YWT NR 11.4.2016 R.Crossley.
†VC63: Wintersett Reservoir 3.5.1979 W.A.Ely.

Tersilochus (Tersilochus) cognatus (Holmgren, 1860). Uncommon in Yorkshire.
Recorded from VC64 in Ely (2012b) p227.
*VC61: Towthorpe + Mowthorpe Dale 26.5.1990 W.A.Ely.
*VC62: Bridestones NT NR 10.6.1984 D.H.Smith.

*VC63: Whitgift 5.1976 A.Grieve.

Tersilochus (Tersilochus) curvator Horstmann, 1981. Rare in Yorkshire.

†VC63: Letwell Plantation, Ulley 5.5.1987 W.A.Ely.

Tersilochus (Tersilochus) longicornis (Thomson, 1889). Rare in Yorkshire.

†VC61: Stone Creek 7.6.1980 P.Skidmore.

Tersilochus (Tersilochus) obliquus (Thomson, 1889). Rare in Yorkshire.
Recorded from VC64 in Ely (2012a) p224.

*VC61: Sands Farm 7.6.1980 W.A.Ely.

*VC63: Bondhay Dyke SW of Lob Wells Wood 30.5.1985 W.A.Ely.

Tersilochus (Tersilochus) obscurator (Aubert, 1959). Scarce in Yorkshire.

*VC61: Mowthorpe Dale Plantation 26.5.1990 W.A.Ely.

†VC63: Maltby 29.5.1984 W.A.Ely.

*VC64: Hollins Hill, Baildon 6-12.5 + 1-7.6.2015 H.N.Whiteley.

The YNU records of Tersilochinae have been compiled as follows:

Decade	Species	Records	Records/Species	Collectors
1860-1869	4	4	1	1
1910-1919	1	1	1	1
1920-1929	1	1	1	1
1930-1939	1	1	1	2
1940-1949	3	7	2.3	2
1950-1959	1	1	1	1
1970-1979	8	15	2	6
1980-1989	29	123	4.3	13
1990-1999	15	41	2.7	5
2000-2009	22	77	3.5	7
2010-2019	27	147	5.4	14

Subfamily **OPHIONINAE**

Enicospilus adustus (Haller, 1885). Rare in Yorkshire.
Recorded from VC64 in Ely (2015b) p234.

*VC61: Wheldrake Ings YWT NR 26.7 + 6.8.2016 J.O.H.Small.

Enicospilus cerebrator (Aubert, 1966). Rare in Yorkshire.
Recorded from VC62 in Broad & Shaw (2016) p12,26.

Enicospilus combustus (Gravenhorst, 1829). Scarce in Yorkshire.
Recorded from VC62, VC64 and VC65 in Broad & Shaw (2016) p13,26.

*VC61: Wheldrake Ings YWT NR 5.10.2015 J.O.H.Small.

Enicospilus inflexus (Ratzeburg, 1844). Uncommon in Yorkshire.
Recorded from VC62 (as *E. undulatus* (Gravenhorst, 1829)) in Walsh & Rimington (1956) p279, from VC63 (as *E. undulatus*) in Hincks (1945) p37; Smith (1945) p47; and Skidmore, Limbert & Eversham (1987) p127; Skidmore (2006) p148; Ely (2011a) p35 and (2014b) p39 and from VC64 in Hincks (1949a) p33, Gauld (1973) p58 and (1974) p148 and Broad & Shaw (2016) p15,27.

Enicospilus ramidulus (Linnaeus, 1758). Uncommon in Yorkshire.
Recorded from VC61, VC62 and VC65 in Broad & Shaw (2016) p24,26, from VC63 in Skidmore (2006) p148 and Broad & Shaw (2016) p24,26 and from VC64 in Gauld (1973) p58 and Ely (2015b) p234.

The north European species of ***Ophion*** have recently been revised by Johansson & Cederberg (2019) using the results of molecular analysis as well as morphological and ecological information. They

have quadrupled the number of species in Sweden with almost half being newly described. I do not think it would be useful to present the Yorkshire data at this time as much is likely to change.

Subfamily **MESOCHORINAE**

Cidaphus alarius (Gravenhorst, 1829). Rare in Yorkshire.

*VC62: Haxby 14.7.2016 T.J.Crawford.

†VC64: Hollybank Wood, Ripley Estate 28.5.2004 C.H.Fletcher, J.C.Warwick.

*VC65: Magdalen Wood, West Tanfield 14.7. 2004 C.H.Fletcher, J.C.Warwick.

Cidaphus atricillus (Haliday, 1838). Scarce in Yorkshire.

*VC62: Lealholm 13.10.2011 + 27.9.2013 + 15.9.2014 + 4.9.2017 G.Featherstone.

†VC65: Colsterdale 2.9.1984 W.A.Ely.

Astiphromma aggressor (Fabricius, 1804). Rare in Yorkshire.

†VC63: Hardings Lane, Cross Hills 6.7.1930 J.Wood.

Astiphromma hirsutum (Bridgman, 1883). Rare in Yorkshire.

†VC61: Danes Hills, Skipwith Common YWT NR 18.6.1983 W.A.Ely.

Astiphromma italicum Schwenke, 1999. New to Yorkshire.

†VC61: Orchid field, East Cottingwith 9-29.6.2019 J.O.H.Small.

Astiphromma ?mandibulare (Thomson, 1886).

Unconfirmed reports from VC63 in Morley (1903) p160; Roebuck (1907) p214; Morley (1908) p294; Morley (1915) p310.

Astiphromma pictum (Brischke, 1880). Rare in Yorkshire.

†VC62: Castle Hill SSSI, Spring Wood, Rydale 11.5.2017 J.O.H.Small.

Astiphromma splenium (Curtis, 1833). Rare in Yorkshire.

*VC61: Allerthorpe Common 1.7.1984 W.A.Ely.

*VC62: Dalby Forest 3.7.2015 R.Crossley.

†VC63: Ecclesall Woods 15.6.1980 S.Watson.

Astiphromma tenuicorne (Thomson, 1886). Rare in Yorkshire.

†VC63: Pot Riding Wood, Sprotborough Flash YWT NR 24.5.1989 W.A.Ely.

*VC64: Hollins Hill, Baildon 14.10.2016 H.N.Whiteley.

Mesochorus atriventris Cresson, 1872). New to Yorkshire.

†VC62: Terrace Bank Wood spur, Duncombe Park 18-29.7.2019 J.O.H.Small

Mesochorus britannicus Schwenke, 1999. Rare in Yorkshire.

†VC63: Holmehouse Wood 5.8.1929 J.Wood.

*VC64: Hackfall Wood 11.5.2011 C.H.Fletcher.

*VC65: Nosterfield N.R. 22.6.2012 J.C.Warwick.

Mesochorus cimbicis Ratzeburg, 1844.

Unconfirmed reports from VC64 in Wilson (1881) p153; Bairstow, Roebuck & Wilson (1882) p106; Roebuck (1907) p214; Morley (1915) p323.

Mesochorus formosus Bridgman, 1882.

Unconfirmed unlocalised report in Fitch (1883) p67.

Mesochorus fulgurans Curtis, 1833.

Unconfirmed report from VC62 in Walsh & Rimington (1956) p279.

Mesochorus fulgurator Horstmann, 2006. New to Yorkshire.

†VC62: Terrace Bank Wood spur, Duncombe Park 18-29.7.2019 J.O.H.Small

Mesochorus fuscicornis Brischke, 1880.

Unconfirmed report from VC63 in Roebuck (1907) p214.

Mesochorus gemellus Holmgren, 1860.

Unconfirmed reports from VC63 in Morley (1915) p332 and Ely (2014b) p39.

Mesochorus giberius (Thunberg, 1824). Rare in Yorkshire.

Unconfirmed reports from VC62 in Walsh & Rimington (1956) p279 and from VC63 in Morley (1903) p160; Roebuck (1907) p214; Morley (1908) p294 and Morley (1915) p326.

*VC61: Wheldrake Ings YWT NR 14 + 27 + 28.10 + 18 + 23.11.2015 J.O.H.Small.

†VC64: Hollybank Wood 2004 C.H.Fletcher (det. M.R.Shaw).

Mesochorus laricis Hartig, 1838. Rare in Yorkshire.

†VC64: Colton 9.1985 J.Payne.

Mesochorus olerum Curtis, 1833. New to Yorkshire.

†VC61: Orchid field, East Cottingwith 9-29.6.2019 J.O.H.Small.

Mesochorus pectinipes Bridgman, 1883.

Unconfirmed reports from VC63 in Morley (1915) p320 and Ely (2014b) p39.

Mesochorus pictilis Holmgren, 1860.

Unconfirmed report from VC63 in Morley (1915) p334.

Mesochorus tetricus Holmgren, 1860.

Unconfirmed reports from VC61 in Roebuck (1906) p279; Roebuck (1907) p214 and Morley (1915) p317.

Mesochorus vittator (Zetterstedt, 1838),

Unconfirmed reports from VC63 in Morley (1915) p332 and Ely (2014b) p39.

Mesochorus vitticollis Holmgren, 1860. Rare in Yorkshire.

†VC61: Wheldrake Ings YWT NR 13 + 22.6.2016 J.O.H.Small.

The YNU records of Mesochorinae have been compiled as follows:

Decade	Species	Records	Records/Species	Collectors
1880-1889	2	2	1	2
1890-1899	3	3	1	3
1900-1909	5	5	1	4
1920-1929	3	3	1	2
1930-1939	2	2	1	2
1940-1949	2	3	1.5	2
1950-1959	9	12	1.3	1
1980-1989	7	10	1.3	2
2000-2009	3	8	2.7	5
2010-2019	14	36	3.5	8

Subfamily **METOPIINAE**

Chorinaeus brevicalcar Thomson, 1887. Scarce in Yorkshire.

*VC61: Thorpe Hall, Rudston 15.7.1989 W.A.Ely.

*VC62: Kirkleavington 15.6.2013 W.A.Ely.

VC63: Holmehouse Wood 7.7.1935 J.Wood.

†VC64: Bingley Wood 29.6.1935 J.Wood.

*VC65: White Scar, Downholme 25.7.1987 W.A.Ely.

Chorinaeus cristator (Gravenhorst, 1829). Rare in Yorkshire.

*VC61: Ottringham old railway 28.7.2011 P.A.Crowther.

†VC62: Strensall 4.7.1951 J.H.Elliott.

*VC65: Busk, Sleddale 5.7.2013 W.A.Ely.

Chorinaeus funebris (Gravenhorst, 1829). Rare in Yorkshire.

†VC63: Ecclesall Wood 13.6.1980 S.Watson.

Chorinaeus hastianae Aeschlimann, 1975. Rare in Yorkshire.

†VC62: Caydale 24.6.1984 W.A.Ely.

†VC63: Hood Hill, Thorpe Hesley 12.7.1980 W.A.Ely.

Chorinaeus longicornis Thomson, 1887. Rare in Yorkshire.

*VC61: Foggathorpe 12.6.1985 unknown.
*VC63: New Stubbin Colliery 9.6.2018 D.Whiteley.
*VC64: Killingbeck Fields, Leeds 26.5.2013 W.A.Ely.
†VC65: Witton 29.6.1965 [E.Broadhead may have been the collector].

Chorinaeus rhenanus Aeschlimann, 1981. Rare in Yorkshire.

*VC63: Wharncliffe Heath 15.6.1990 D.Whiteley.
†VC64: Harrogate 9.5.1961 [E.Broadhead].

Chorinaeus subcarinatus Holmgren, 1858. Rare in Yorkshire.

†VC63: Hall Dyke 6.5.1986 D.Maude.
*VC65: Foxglove Covert LNR, Catterick 20.4.2011 R.Crossley.

Chorinaeus talpa (Haliday, 1839). Rare in Yorkshire.

†VC63: Lindrick GC 8.5.1982 + 18.5.1986 W.A.Ely.
*VC65: Freeholders Wood 15.6.1985 W.A.Ely.

Trieces tricarinatus (Holmgren, 1858). Rare in Yorkshire.

†VC63: River Don, Thrybergh 7.7.1985 W.A.Ely.

Metopius (Peltocarus) dentatus (Fabricius, 1779). Rare in Yorkshire.

Unconfirmed reports from VC63 in Roebuck (1877) p39; Anon (1877) p124; Bairstow (1878) p69; Butterfield (1908) p71; Morley (1911) p4; Skidmore, Limbert & Eversham (1987) p127; Skidmore (2006) p148; Ely (2011a) p35 and (2014b) p39 and from VC64 in Roebuck (1877) p39; Anon (1877) p124; Roebuck (1907) p214 and Morley (1911) p4. Recorded from VC63 in Hincks & Dibb (1940) p176.

Metopius (Peltastes) pinatorius Brullé, 1846.

Unconfirmed reports from VC64 in Bairstow, Roebuck & Wilson (1882) p106; Roebuck (1907) p215 and Morley (1911) p6-7.

Triclistus aethiops (Gravenhorst, 1829). Rare in Yorkshire.

†VC63: Firbeck Hall 21.6.1987 W.A.Ely.

Triclistus albicinctus Thomson, 1887. Rare in Yorkshire.

*VC61: Pocklington Canal, Melbourne 15.5.2010 W.A.Ely.
†VC62: Malton Road crossing, York 7.9.1944 J.H.Elliott.
*VC63: Beeston Plantation, Potteric Carr YWT NR 11-25.6.2018 J.Horsfall.
*VC64: Hollins Hill, Baildon 10.2013 + 1-8.7.2015 H.N.Whiteley.

Triclistus anthophilae Aeschlimann, 1983. Rare in Yorkshire.

†VC63: Maltby Low Common YWT NR 3.7.1985 W.A.Ely.
*VC64: Hollins Hill, Baildon 9.2013 H.N.Whiteley.

Triclistus globulipes (Desvignes, 1856). Uncommon in Yorkshire.

*VC61: Allerthorpe Common 23.6.1951 J.H.Elliott.
*VC62: Coatham 7.8.2011 W.A.Ely.
*VC63: Langold Holt 30.6.1985 W.A.Ely.
†VC64: Askham Bog YWT NR 7.9.1946 W.D.Hincks.

Triclistus lativentris Thomson, 1887. Rare in Yorkshire.

Recorded from VC61 in Ely (2014a) p236.

*VC64: Hollins Hill, Baildon 26-29.8.2016 H.N.Whiteley.

Triclistus pallipes Holmgren, 1873. Rare in Yorkshire.

Recorded from VC63 in Ely (2014b) p45.

Triclistus podagricus (Gravenhorst, 1829). Scarce in Yorkshire.

*VC62: Ashberry Pastures YWT NR 15.6.1977 P.Skidmore.
*VC63: Maltby Wood 29.5.1980 + 11.5.1985 W.A.Ely.
†VC64: Harrogate 27.5 + 9.6.1961 [E.Broadhead].

*VC65: Witton 27.5.1963 + 8.8.1964 + 17 + 22 + 29.5 + 17.6.1965 [E.Broadhead].

Triclistus pubiventris Thomson, 1887. Rare in Yorkshire.

†VC64: Hollins Hill, Baildon 8.2013 + 14-20.8.2015 + 10-12.9.2016 H.N.Whiteley.

Scolomus borealis (Townes, 1971). Rare in Yorkshire.

†VC63: Binn Green RSPB NR, Saddleworth 24.6.2012 W.A.Ely.

Synosis caesiellae Broad & Shaw, 2005. New to Yorkshire.

†VC63: Pot Riding Wood, Sprotborough Flash YWT NR 24.8.1989 W.A.Ely (tG.R.Broad).

Synosis parenthesellae Broad & Shaw, 2005. New to Yorkshire.

†VC63: Lindholme 15.8.2019 D.Williamson.

Hypsicera curvator (Fabricius, 1793). Scarce in Yorkshire.

Unconfirmed report from VC62 in Roebuck (1877) p38; Roebuck (1907) p215 and Morley (1911) p26. Recorded from VC64 in Hincks (1945) p37.

*VC61: Bubwith 8.1917 W.J.Fordham (C.Morley,t.A.Hunter).

*VC63: Park Street, Keighley 6.8.1952 J.Wood.

Hypsicera femoralis (Geoffroy, 1785). Rare in Yorkshire.

†VC64: Hollins Hill, Baildon 22 + 29-31.8.2015 + 1-5 + 18 + 19 + 20.9.2016 H.N.Whiteley.

Hypsicera flaviceps (Ratzeburg, 1852). Uncommon in Yorkshire.

*VC61: Rush Wood, Naburn 10-17.6 + 11-18.9.2003 S.E.M.Fraser.

*VC62: Beningbrough Hall NT American Garden 13.8.2015 W.A.Ely.

†VC63: Norwood 23.6.2000 W.A.Ely.

*VC64: Hollins Hill, Baildon 7 + 8 + 9.2013 + 24-30.6 + 23 + 29-31.8 + 1-6.9 + 1-3.10.2015 H.N.Whiteley.

Exochus albicinctus Holmgren, 1873. Scarce in Yorkshire.

*VC61: Stone Dale picnic area 5.6.2013 W.A.Ely.

†VC62: Clifton Ings 15.5.1943 J.H.Elliott.

*VC63: Pennyholme 2.7.1984 W.A.Ely.

*VC64: Halton Moor 27.5.2013 W.A.Ely.

*VC65: Leighton Reservoir 3.6.1979 W.A.Ely.

Exochus alpinus (Zetterstedt, 1838).

Unconfirmed report from VC63 in Morley (1915) p48 and Ely (2014b) p39.

Exochus carri Schmiedeknecht, 1924. Rare in Yorkshire.

†VC64: Malham Tarn NT 15.9.1957 W.D.Hincks.

Exochus erythronotus (Gravenhorst, 1820). Rare in Yorkshire.

Recorded from VC63 in Denton (2017) p445.

Exochus flavomarginatus Holmgren, 1856. Scarce in Yorkshire.

*VC61: Bracepits Wood, Melbourne Hall + Wigman Wood, Wheldrake 4-11.9.2003 S.E.M.Fraser.

*VC62: Skinningrove 3.9.2011 R. & R.Key.

*VC63: Thorne Moors NNR canals 24.6-14.7.1987 W.A.Taylor.

†VC64: Malham Tarn NT 15.9.1957 W.D.Hincks.

*VC65: River Dee in Dentdale 29.9.2012 W.A.Ely.

Exochus gravipes (Gravenhorst, 1820). Rare in Yorkshire.

†VC61: Allerthorpe 6.7.1951 J.H.Elliott.

*VC62: Strensall Common 23.8.2013 R.Crossley.

*VC63: Thorpe Marsh YWT NR 4.9.2011 W.A.Ely.

Exochus lictor Haliday, 1839. Rare in Yorkshire.

Unconfirmed report from VC62 in Walsh & Rimington (1956) p278.

*VC61: Wheldrake Ings YWT NR 30.10.2015 J.O.H.Small.

†VC62: Goathland 22.7.1979 W.A.Ely.

*VC65: Ellington Banks 25.5.2011 C.H.Fletcher.

Exochus nigripalpis Thomson, 1887. Scarce in Yorkshire.

*VC61: East Cottingwith Ings 4.8.2013 R.Crossley.

*VC63: Denaby Ings YWT NR 19.5.1974 C.A.Howes.

†VC64: Askham Bog YWT NR 29.8.1950 J.H.Elliott.

Exochus pictus Holmgren, 1858. Scarce in Yorkshire.

*VC62: Back Lane/Broad Gate Road, Westerdale 18.8.2012 W.A.Ely.

*VC63: Maltby Low Common YWT NR 4.9.1982 W.A.Ely.

†VC64: Malham Tarn NT 13.9.1957 W.D.Hincks.

*VC65: Colsterdale 2.9.1984 W.A.Ely.

Exochus prosopius Gravenhorst, 1829. Scarce in Yorkshire.

*VC61: Easington 14.8.2013 W.A.Ely.

*VC62: Dalton Bridge 13.8.2011 W.A.Ely.

†VC63: Blackbrook Wood 16.8.1973 W.Davison.

*VC64: Low Field Lane, Grafton Lodge 13.7.2011 W.A.Ely.

*VC65: Nosterfield NR 11.8.2016 C.H.Fletcher.

Exochus rubroater Schmiedeknecht, 1924. Rare in Yorkshire.

*VC61: Sandy Lane, Scampston 21.7.2012 W.A.Ely.

†VC63: Cusworth Park 7.8.1975 P.Skidmore.

Exochus semilividus Vollenhoven, 1875. Rare in Yorkshire.

*VC61: Rush Wood, Naburn 11-18.9.2003 S.E.M.Fraser.

†VC63: Common Plantation, Thrybergh pupa em 7.3.1977 J.E.Addey, P.G.Stenton.

*VC64: Hollins Hill, Baildon 8.2013 H.N.Whiteley.

Exochus tibialis Holmgren, 1858. Rare in Yorkshire.

†VC61: Allerthorpe 23.6.1951 J.H.Elliott.

*VC62: Stockton Hermitage 5.10.1951 J.H.Elliott.

*VC64: Malham Tarn NT Fen 1-9.9.2013 P.W.H.Flint, S.Flint.

The YNU records of Metopiinae have been compiled as follows:

Decade	Species	Records	Records/Species	Collectors
1830-1839	1	1	1	1
1840-1849	1	1	1	1
1850-1859	1	1	1	1
1860-1869	1	1	1	1
1870-1879	2	5	2.5	3
1880-1889	1	1	1	1
1900-1909	3	3	1	3
1910-1919	6	10	1.7	6
1920-1929	4	5	1.2	3
1930-1939	5	7	2.4	5
1940-1949	4	5	1.25	3
1950-1959	11	11	1	3
1960-1969	4	13	3.3	2
1970-1979	9	14	1.7	7
1980-1989	19	49	2.7	6
1990-1999	9	10	1.1	6
2000-2009	8	30	3.5	4
2010-2019	25	125	5	13

Subfamily **ANOMALONINAE**

Heteropelma amictum (Fabricius, 1775). Rare in Yorkshire.
Desvignes holotype of *H. capitatum* is reported in Morley (1915) p228; Ely (1998) p62 and Ely (2011a) p35.

Heteropelma megarthrum (Ratzeburg, 1848). Rare in Yorkshire.

†VC61: Allerthorpe Common 30.6.1984 W.A.Ely.

Therion circumflexum (Linnaeus, 1758). Rare in Yorkshire.
Unconfirmed report from VC62 in Roebuck (1907) p215 and Morley (1915) p228. Recorded from VC61 in Fordham (1919) and from VC63 in Ely (1998) p62 and Coldwell (1999) p61.

*VC62: Bridestones NT NR 1984 D.H.Smith.

Trichomma enecator (Rossi, 1790). Scarce in Yorkshire.
Unconfirmed reports from VC61 in Fordham (1929) p375. Recorded from VC61 in Ely (1985) p76 and from VC63 in Ely (1998) p62.

*VC62: Sand Hutton 29.5.1951 J.H.Elliott.
*VC64: Grassington em 25.5.1929 W.G.Clutton.

Trichomma intermedium Krieger, 1904. Rare in Yorkshire.

†VC61: Allerthorpe Common 8.8.1989 W.A.Ely.

Camposcopus nigricornis (Wesmael, 1849). Uncommon in Yorkshire.
Unconfirmed report from VC64 in Wilson (1881) p153; Bairstow, Roebuck & Wilson (1882) p105 and Roebuck (1907) p214. Recorded from VC62 in Walsh & Rimington (1956) p278 and from VC63 in Ely (1998) p62; Coldwell (1999) p61 and Denton (2017) p445.

*VC61: Allerthorpe Common 28.5.1931 J.Wood.
*VC64: Temple Newsam 7.10.1979 W.A.Ely.
*VC65: Colsterdale 5.6.1982 W.A.Ely.

Aphanistes gliscens (Hartig, 1838). Rare in Yorkshire.
Unconfirmed unlocalised report in Bairstow, Roebuck & Wilson (1882) p105; Roebuck (1907) p214 and Morley (1915) p245. Recorded from VC63 in Key (1986) p104 and Ely (1998) p63.

*VC64: Ling Ghyll 2.7.1942 W.D.Hincks.

Erigorgus cerinops (Gravenhorst, 1829). Rare in Yorkshire.
Unconfirmed report from VC63 in Butterfield (1909) p197. Recorded from VC62 in Smith (1989) p74 and from VC63 in Ely (1998) p63.

Erigorgus melanops (Föster, 1855). New to Yorkshire.

†VC61: Pocklington Canal bank, Thornton 28.3.2019 R.Crossley.

Barylypa delictor (Thunberg, 1824). Rare in Yorkshire.
Unconfirmed report from VC63 in Ely (1998) p63. Recorded from VC62 in Ely (2013b) p237.

Barylypa propugnator (Förster, 1855). Rare in Yorkshire.
Unconfirmed report from VC63 in Anon (1914) p31; Ely (1998) p63; Coldwell (1999) p61 and Ely (2014b) p39.

*VC61: Cali Heath YWT NR 15.7.2011 R.Crossley.
*VC63: Abbeydale Hamlet 22.8.2002 A.Brackenbury.

Agrypon anxium (Wesmael, 1849).
Unconfirmed reports from VC63 in Ely (1986) p6 and (2014b) p39.

Agrypon batis (Ratzeburg, 1855). Rare in Yorkshire.
Recorded from VC63 (as *Agrypon anxium*) in Ely (1998) p65.

*VC64: Ellington Banks 13.7.2004 C.H.Fletcher (det. M.R.Shaw).

Agrypon canaliculatum (Ratzeburg, 1844). New to Yorkshire.
Recorded from VC63 (as *Agrypon anxium*) in Ely (1998) p65.

Agrypon clandestinum (Gravenhorst, 1829). Uncommon in Yorkshire.
Unconfirmed reports from VC64 in Morley (1915) p248 & 257. Recorded from VC63 in Ely (1998)

p65; Coldwell (1999) p61 and Skidmore (2006) p148.

*VC61: Skipwith Common NNR 24.5.2011 R.Crossley.
*VC62: (?) N.Yorkshire ex *xylostella* 9.1930 A.Smith.
*VC64: Bingley Wood 27.9.1941 J.Wood.

Agrypon flaveolatum (Gravenhorst, 1807). Frequent in Yorkshire.
Unconfirmed reports from VC61 in Hincks (1953b) p136, from VC63 in Bairstow (1879) p144, 185; Bairstow, Roebuck & Wilson (1882) p105; Roebuck (1907) p214; Carr (1914) p94; Ely (1998) p63 and (2014b) p39 and from VC64 in Roebuck (1907) p214 and Morley (1915) p255-6 & 258. Recorded from VC62 in Hincks (1951) p28; Walsh & Rimington (1956) p278; Hincks (1956) p149 and Key (1987) p152; from VC63 in Hincks (1949b) p62; Coldwell (1999) p61; Ely (1998) p63 and (2014b) p39 and from VC64 in Cheetham (1942) p164.

*VC61: Barmby Moor 1.7.1945 J.H.Elliott.
*VC65: Witton Fell 14.5.1964 [E.Broadhead].

Agrypon flexorium (Thunberg, 1822). Scarce in Yorkshire.
Recorded from VC63 in Ely (1998) p65 and Skidmore (2006) p148.

*VC61: Skipwith 23.6.1953 J.H.Elliott.
*VC62: Malton Rd, York 7.5.1944 + 7.7.1945 J.H.Elliott.
*VC64: Shipley Glen 20.6.1931 J.Wood.

Agrypon varitarsum (Wesmael, 1849). Rare in Yorkshire.

†VC62: Malton Road, York 26.5.1943 J.H.Elliott.
*VC63: Canklow Wood 6.9.2005 W.A.Ely.
*VC64: Temple Newsam ex *Tinea fagella* em 7.4 + 5.1944 RP (det. I.D.Gauld).

The YNU records of Anomaloninae have been compiled as follows:

Decade	Species	Records	Records/Species	Collectors
1850-1859	1	1	1	1
1870-1879	2	2	1	2
1880-1889	3	3	1	3
1890-1899	3	3	1	2
1900-1909	4	5	1.2	4
1910-1919	5	7	2.4	5
1920-1929	3	4	1.3	4
1930-1939	5	9	2.8	6
1940-1949	8	30	3.75	6
1950-1959	4	15	3.75	3
1960-1969	1	1	1	2
1970-1979	5	15	3	4
1980-1989	10	75	7.5	12
1990-1999	6	14	2.3	6
2000-2009	9	18	2	12
2010-2019	9	35	4	14

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Water plants in the Lancaster Canal

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Introduction

The Lancaster Canal from Preston northward to Tewitfield near Carnforth provides c.68km of largely rural navigable waterway on one level and without locks that is used for leisure boating. Navigation once extended further northward from the now disused lock flight at Tewitfield for c.23km to Kendal. The canal north of Tewitfield was severed in several places in the 1960s by culverts where it is crossed by the M6 and other roads. The channel, however, still contains water for c.14km north of Tewitfield and carries feed water to the still-navigated canal to the south (Anon., 2009, Laws, 2017). Although the line of the canal is generally north-south it has twists and turns as it follows its contour; in this article north means towards Kendal and south towards Preston rather than necessarily describing geographical direction.

The canal is recognised as an important habitat for water plants. The whole of the canal in Lancashire is designated by the County Council as a Biological Heritage Site, largely because of its rich plant assemblage. Studies of the plants found in the canal and their history from the early 19th century to the early 21st were reviewed by Greenwood (2005). Both continuity of the flora and recent change, related to eutrophication and boating, are emphasised by that review. Livermore & Livermore (1987) and Greenwood (2012) made apparent the significance of the canal as a habitat for aquatic plants in North Lancashire.

This article reports surveys of aquatic plants made during the summers of 2016-2018 and compares the flora of the disused canal north of Tewitfield Locks with that further south around Lancaster and Carnforth where the canal is used for leisure navigation. Change in the canal flora is also addressed by comparison of data from 2016-2018 with earlier survey results.

Water plants north and south of Tewitfield in 2016-2018

Water plants were recorded in six 0.5km lengths of canal north of Tewitfield and in six lengths south of Tewitfield (Table 1). The northern lengths (N1-N6) are in VC69 Westmorland while the southern lengths (S1-S6) are in VC60 West Lancashire. The relevant modern county floras are Halliday (1997) and Greenwood (2012).

Table 1. 0.5km lengths of the Lancaster Canal in which plants were recorded in 2016-2018.

Length No.	Position	Date of survey
North of Tewitfield Locks		
N1	0.5-1 km north of the M6 culvert at Millness (SD 537830)	August 2016
N2	0-0.5 km north of the M6 culvert at Millness	August 2016
N3	0-0.5km north of Holme Road North culvert (Bridge153a) (SD527798) at Holme	September 2018
N4	0-0.5km south of Holme Road North culvert (Bridge153a) at Holme	September 2018
N5	0-0.5km north of Bridge 147 (SD527782) at Holme Mills	September 2018
N6	0-0.5km south of Bridge 147 at Holme Mills	September 2018
South of Tewitfield Locks		
S1	0.5-1 km north of Bridge 128 (B6254) at Carnforth (SD501704)	July 2016
S2	0-0.5 km north of Bridge 128 (B6254) at Carnforth	July 2016
S3	0-0.5km south of Bridge 128 (B6254) at Carnforth	September 2017
S4	0.5-1.0km south of Bridge 128 (B6254) at Carnforth	September 2017
S5	0.5-1km north of Bridge 101 (SD481616) at Lancaster	September 2017
S6	0-0.5km north of Bridge 101 at Lancaster	September 2017

When necessary, plants were retrieved for identification using a grapnel or an extensible walking pole with a hook attached to its end. Those on the far side were sometimes identified using binoculars. Plants were recorded only if they feature on the Joint Nature Conservation Committee checklists of c.160 aquatic plants that have been recorded from, or possibly occur in, canals in the UK (JNCC, 2005). The abundance of plants in each 0.5km length was assessed using the procedure developed for rivers by Holmes (1983). Three abundance categories were used: <0.1% whole-channel cover, 0.1-5% cover and >5% cover. Nomenclature follows Stace (2019); scientific names are given in the text only if they do not appear in the tables.

Water plants found are listed in Table 2 (p47). The complete data set (eAppendix 1) is available online at https://www.ynu.org.uk/naturalist. The separation into submerged/floating-leaved plants and submerged plants is to help interpretation although for some plants it is somewhat arbitrary. In all, 50 water plants were found; 30 north and 42 south of Tewitfield. There were 25 submerged and floating-leaved plants (11 north and 20 south of Tewitfield) and 25 emergent plants (19 north and 22 south of Tewitfield). For the six lengths north of Tewitfield, the mean number of plants per 0.5km length equalled 18.8 (range 14-23) standard deviation=3.4. For the

lengths south of Tewitfield the mean equalled 22.8 (range 17-29) sd=4.3. The difference was not statistically significant ($P>0.05$, Mann-Whitney *U*-test). However, the results in Table 2 show that aquatic vegetation was significantly more abundant in the northern lengths. When all 12 lengths and all species were considered, there were 31 instances when a score of >5% cover was recorded. Of these, 28 were from the northern lengths and only three from the southern. This was significantly different from the null hypothesis of equal number of >5%-cover records in northern and southern lengths ($P<0.01$, X^2-test).

Table 2. Water plants in the Lancaster Canal, 2016-2018.

	North of Tewitfield Locks	South of Tewitfield Locks
Submerged and floating-leaved plants		
Callitriche sp. Water-starwort	0	1
Ceratophyllum demersum Rigid Hornwort	2	1
Chara/Nitella Stonewort	3	0
Crassula helmsii New Zealand Pigmyweed	0	2
Elodea canadensis Canadian Waterweed	6(1)	0
Elodea nuttallii Nuttall's Waterweed	6(6)	6
Fontinalis antipyretica Greater Water-moss	0	1
Hippuris vulgaris Mare's-tail	0	2
Hydrocharis morsus-ranae Frogbit	3	0
Lemna minor Common Duckweed	6(3)	6
Lemna trisulca Ivy-leaved Duckweed	4	4
Myriophyllum spicatum Spiked Water-milfoil	0	5
Nuphar lutea Yellow Water-lily	0	4
Nymphaea x marliacea Coloured Water-lily	1	0
Nymphoides peltata Fringed Water-lily	6(5)	6(2)
Potamogeton berchtoldii Small Pondweed	0	2
Potamogeton crispus Curled Pondweed	0	2
Potamogeton natans Broad-leaved Pondweed	0	1
Potamogeton obtusifolius Blunt-leaved Pondweed	4	0
Potamogeton pusillus Lesser Pondweed	0	3
Sagittaria sagittifolia Arrowhead	0	3
Sparganium emersum Unbranched Bur-reed	0	4
Spirodela polyrhiza Greater Duckweed	6(1)	4
Stuckenia pectinata Fennel Pondweed	0	3
Zannichellia palustris Horned Pondweed	0	3
Emergent plants		
Acorus calamus Sweet-flag	0	6
Agrostis stolonifera Creeping Bent	1	6
Alisma plantago-aquatica Water-plantain	0	1
Berula erecta Lesser Water-parsnip	0	1
Butomus umbellatus Flowering-rush	4	6
Carex pseudocyperus Cyperus Sedge	1	0
Eleocharis palustris Common Spike-rush	1	0
Equisetum fluviatile Water Horsetail	1	2
Glyceria fluitans Floating Sweet-grass	0	1
Glyceria maxima Reed Sweet-grass	0	2(1)
Helosciadium nodiflorum Fool's-water-cress	5	1

Iris pseudacorus Yellow Iris	5	6
Juncus effusus Soft-rush	4	1
Mentha aquatica Water Mint	6(1)	6
Myosotis scorpioides Water Forget-me-not	6	5
Nasturtium officinale Water-cress	3	1
Oenanthe crocata Hemlock Water-dropwort	3	3
Persicaria amphibia Amphibious Bistort*	4	5
Phalaris arundinacea Reed Canary-grass	6(6)	6
Phragmites australis Common Reed	1	2
Ranunculus lingua Greater Spearwort	0	4
Solanum dulcamara Bittersweet	4	1
Sparganium erectum Branched Bur-reed	5(4)	6
Typha latifolia Bulrush	4	2
Veronica beccabunga Brooklime	2(1)	0

Values are the number of 0.5km lengths (out of six) in which plants were recorded. Values in brackets represent the number of lengths in which plants had >5% whole-channel cover.

*Sometimes found as a floating-leaved plant.

Indeed, the canal north of Tewitfield (Lengths N1-6) was characterised by luxuriant aquatic vegetation (Figures 1 & 2 p49). The water was transparent and, apart from Length N1 which was north of the canal's major feeder, there was an appreciable flow of water. Mostly, there was a central channel between margins of emergent vegetation. The central channel along Lengths N1 and N2 appeared to be kept open by the Lancaster Canal Trust's trip boat *Waterwitch* which operates on summer Sundays along this disconnected section of canal. Further south (Lengths N3-N6) the marginal emergent vegetation tended to encroach more into the central channel. The whole of the central channel was usually occupied by abundant submerged and floating-leaved vegetation. Grapnel hauls retrieved great quantities of Nuttall's Waterweed while Canadian Waterweed was also found and sometimes Blunt-leaved Pondweed. Surface cover of Fringed Water-lily was extensive, as was that of Common Duckweed and Greater Duckweed. Frogbit was a less-abundant floating-leaved plant.

Soft edges and wide margins of tall emergent vegetation were a widespread feature of the northern canal. Reed Canary-grass was the pre-eminent emergent plant while Branched Bur-reed was often conspicuous and tended to form a fringe of vegetation in deeper water, beyond marginal stands of Reed Canary-grass. Other, often found, interspersed emergent plants included Flowering-rush, Fool's-water-cress, Yellow Iris, Soft-rush, Water Mint, Water Forget-me-not, Amphibious Bistort, Bittersweet and Bulrush.

South of Tewitfield (Lengths S1-6), leisure boats operated and the water was very turbid. Submerged and floating-leaved plants were sparse (Figure 3, p53). Random grapnel hauls in turbid water rarely yielded any underwater vegetation. Floating, loose shoots were found but beds of submerged plants were limited in extent. Most conspicuous amongst submerged and floating-leaved plants was Fringed Water-lily, which was found in all six lengths and reached 5% cover at Carnforth in Lengths S1 and S2. Otherwise, only New Zealand Pigmyweed, Mare's-tail, Yellow Water-lily and Unbranched Bur-reed were ever recorded at >0.1% cover (each at 0.1-5% cover in one length only).

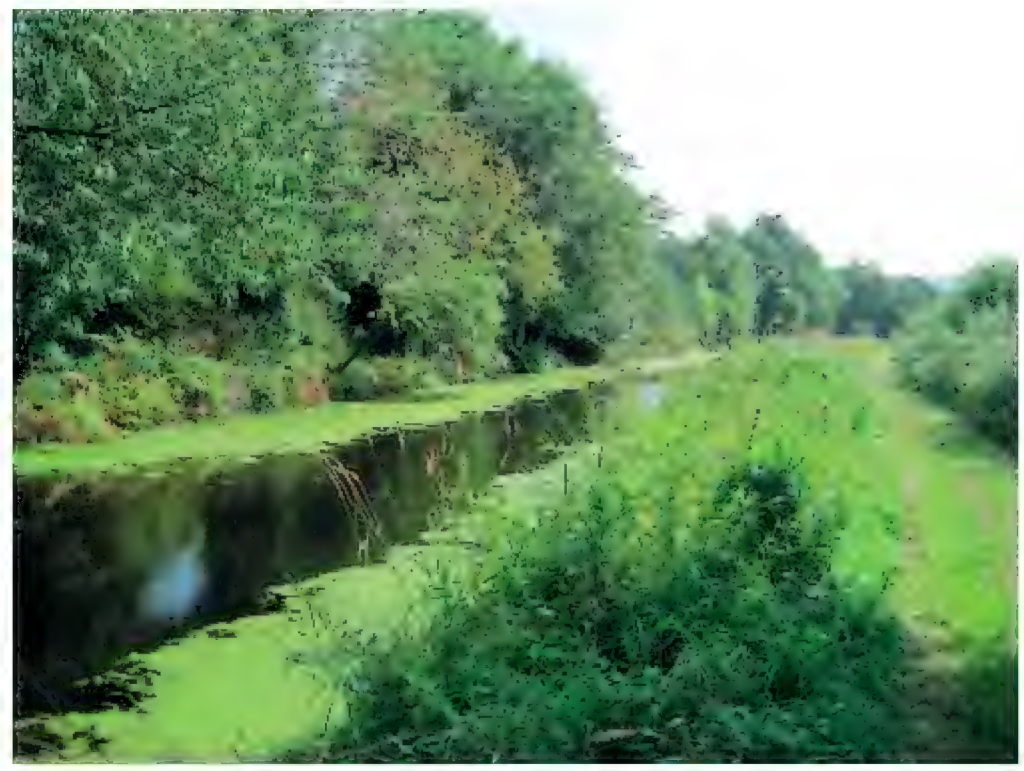

Figure 1. The Lancaster Canal at Millness, north of Tewitfield, August 2016. There is clear water and submerged and floating-leaved plants are abundant, the marginal vegetation is largely Reed Canary-grass. The central channel of this isolated section of waterway is apparently kept open by the occasional passage of a trip boat.

Figure 2. The Lancaster Canal at Holme, north of Tewitfield, September 2018. The wide margins, of principally Reed Canary-grass and Branched Bur-reed, encroach on the central channel which has clear water and abundant submerged vegetation.

Parts of the canal south of Tewitfield have hard vertical margins and emergent marginal vegetation was often absent. Otherwise, it was sparser than in the northern lengths and usually not more than 1 or 2m wide. In places, as along Length S3 at Carnforth, shading by canal-side trees clearly suppressed plant growth. Sweet-flag, Creeping Bent, Flowering-rush, Yellow Iris, Water Mint, Reed Canary-grass and Branched Bur-reed were found in all six southern lengths but mostly at <0.1% cover and none reached 5%. Reed Sweet-grass, found in Lengths S5 and S6 in Lancaster, was the only plant recorded as reaching 5% cover (in Length S6).

Notwithstanding the lesser overall abundance of emergent plants along the southern canal, there were stretches of marginal emergent vegetation that were both species rich and botanically interesting. For example, 18 emergent water plants were found in Length S1 at Carnforth along with several wetland and riparian ones (Table 3, p50; Figure 4, p53). Similarly, Lengths S5 and S6 at Lancaster had, respectively, 13 and 14 emergent plants. These included plants not found in Length S1; i.e. Water-plantain, Reed Sweet-grass, Fool's-water-cress and Water-cress.

Table 3. Plants in the margin along 0.5km of canal (Length S1) at Carnforth, July 2016

Emergent aquatic plants	Wetland and riparian plants
Acorus calamus Sweet-flag	*Carex pendula* Pendulous Sedge
Agrostis stolonifera Creeping Bent	*Carex remota* Remote Sedge
Berula erecta Lesser Water-parsnip	*Epilobium hirsutum* Great Willowherb
Butomus umbellatus Flowering-rush	*Equisetum arvense* Field Horsetail
Equisetum fluviatile Water Horsetail	*Filipendula ulmaria* Meadowsweet
Glyceria fluitans Floating Sweet-grass	*Galium palustre* Common Marsh-bedstraw
Iris pseudacorus Yellow Iris	*Juncus inflexus* Hard Rush
Juncus effusus Soft-rush	*Lycopus europaeus* Gypsywort
Mentha aquatica Water Mint	*Stachys palustris* Marsh Woundwort
Myosotis scorpioides Water Forget-me-not	
Oenanthe crocata Hemlock Water-dropwort	
Persicaria amphibia Amphibious Bistort	
Phalaris arundinacea Reed Canary-grass	
Phragmites australis Common Reed	
Ranunculus lingua Greater Spearwort	
Solanum dulcamara Bittersweet	
Sparganium erectum Branched Bur-reed	
Typha latifolia Bulrush	

Water plants in the canal at Millness in 2016 compared with earlier years

In July 2002 I recorded water plants north of Tewitfield in the two 0.5km lengths (N1 and N2) immediately north of the culvert beneath the M6 at Millness. At that time these lengths had evidently recently been dredged, probably during winter 2001-2002. This made this isolated section of canal navigable for operation of the Lancaster Canal Trust's trip boat. There was an open mid-canal channel (estimated width c.8m) with shallow (depth c.0.5-1m) water. This channel had few aquatic plants, the uncolonized mud of the canal bed being clearly visible through transparent water. Remaining emergent marginal vegetation, largely Reed Canary-grass, was generally <2m wide. Along the towing path (west) side of Length 2, a vertical geotextile curtain, supported by vertical wooden posts, had been installed. Behind this was held mud dredged from the channel. This contained rhizomes of Reed Canary-grass, many of which were re-establishing in the margin behind the curtain. This approach to maintenance of canal banks, as used in the Leeds & Liverpool Canal, is described by Goulder (2019).

The aquatic plants at Millness in 2002 were much the same as in 2016 (Table 4, p51). Thus, 15 plants found in 2002 were still there in 2016, while seven plants were apparently lost and eight gained. The water-starwort found in 2002 was not determined to species but otherwise all the apparently lost plants, except Marsh-marigold, were found elsewhere in the canal in 2016-2018. Amongst the apparently new plants only Cyperus Sedge was not found elsewhere in 2016-2018 – Halliday (*loc. cit.*) has few records for this plant in Cumbria and Greenwood (2012) regards it as occasional in North Lancashire. Also, amongst the new plants, Frogbit and Greater Duckweed were not recorded in Cumbria by Halliday (1997), while Fringed Water-lily was sparse and scattered. These, however, may arise from the contaminants and discards of water-gardening and all three appear to be expanding their range in northern canals (Goulder, 2019).

Table 4. Water plants recorded in the Lancaster Canal along 1.0km north from the M6 culvert at Millness, July 2002 and August 2016.

Submerged and floating-leaved plants	Emergent plants
Recorded in both 2002 and 2016 *Elodea canadensis* Canadian Waterweed *Elodea nuttallii* Nuttall's Waterweed* *Lemna minor* Common Duckweed* *Nymphaea x marliacea* Coloured Water-lily n=4	*Agrostis stolonifera* Creeping Bent *Equisetum fluviatile* Water Horsetail *Iris pseudacorus* Yellow Iris *Juncus effusus* Soft-rush *Mentha aquatica* Water Mint* *Myosotis scorpioides* Water Forget-me-not *Nasturtium officinale* Water-cress *Persicaria amphibia* Amphibious Bistort *Phalaris arundinacea* Reed Canary-grass*† *Solanum dulcamara* Bittersweet *Sparganium erectum* Branched Bur-reed n=11
Recorded 2002 but not in 2016 *Callitriche* sp. Water-starwort *Lemna trisulca* Ivy-leaved Duckweed *Potamogeton crispus* Curled Pondweed *Potamogeton pusillus* Lesser Pondweed n=4	*Acorus calamus* Sweet-flag *Caltha palustris* Marsh-marigold *Veronica beccabunga* Brooklime n=3
Recorded in 2016 but not in 2002 *Hydrocharis morsus-ranae* Frogbit *Nymphoides peltata* Fringed Water-lily* *Potamogeton obtusifolius* Blunt-leaved Pondweed *Spirodela polyrhiza* Greater Duckweed* n=4	*Carex pseudocyperus* Cyperus Sedge *Helosciadium nodiflorum* Fool's-water-cress *Oenanthe crocata* Hemlock Water-dropwort *Typha latifolia* Bulrush n=4

*Recorded at >5% cover in at least one of two 0.5km lengths in August 2016;
†recorded at >5% cover in at least one of two 0.5km lengths in July 2002.

The big change at Millness between 2002 and 2016 was a great increase in the abundance of aquatic vegetation. In 2002, Reed Canary-grass was recorded at >5% cover in both Lengths N1 and N2 but no other plant achieved this level of abundance. This was very different from the situation 14 years later when Nuttall's Waterweed, Common Duckweed, Fringed Water-lily, Greater Duckweed, Water Mint and Reed Canary-grass were recorded with >5% cover in one or both of Lengths N1 and N2.

Going back 50 years, I measured diurnal change in dissolved oxygen concentration at two sites in the canal north of Millness, in July-August 1969 in order to investigate photosynthesis by submerged plants (Goulder, 1970). One site was Crooklands Bridge (SD534836) which, at c.0.7km north of the present-day M6 culvert, lies within Length N1 (Table 1, p46). The other was adjacent to Stainton Crossing Bridge (SD521854) which is c.3.6km north of the M6 culvert. Commercial boat traffic had ceased in 1944 (Laws, *loc. cit.*) and in 1969 this section had clear water up to c.1m depth and had luxuriant submerged plants (immediately north of the bridge at Stainton were stop planks beyond which the water level was no longer maintained).

The principal plants within a mixed community included Soft Hornwort *Ceratophyllum submersum*, Canadian Waterweed, Small Pondweed, and Common Duckweed. These identifications were made using a hand lens and Clapham, Tutin & Warburg (1962) and some evaluation is appropriate. I am confident about Soft Hornwort – I was at that time familiar with the similar Rigid Hornwort (Goulder & Boatman, 1971). Soft Hornwort is rare in North Lancashire and in Cumbria but there are several records from the Lancaster Canal in the 1960s, including at Stainton (Halliday, 1997; Greenwood, 2012). There is a specimen in the Freshwater Biological Association herbarium (FBAH0105) collected by M.R. Gilson at Stainton in 1963 – an image is available at http://www.environmentdata.org.archive/ fbaia:1864. My 1969 identification of Small Pondweed was necessarily done without the now invaluable help of Preston (1995) and did not include sectioning of stipules. I suspect that the plant was either Small Pondweed or Lesser Pondweed – both were found in the canal in 2016-2018 although neither was recorded north of Tewitfield.

The submerged vegetation in 1969 was in places entangled at the surface by mass growth of algae, conspicuous amongst this was the macroscopic Water Net *Hydrodictyon reticulatum* – a cosmopolitan alga that through excessive biomass sometimes becomes a nuisance in eutrophic hard waters in North America (Prescott, 1962) and the UK (John & Tsarenko, 2002). This distinctive plant was still to be seen in the canal at Millness in both 2002 and 2016.

Discussion

The 50 water plants found along the canal (Table 2, p47) is a good number, although more may have been recorded had the survey been more extensive. Two of the native plants found in the northern lengths (VC69) feature in *The Rare Plant Register of Cumbria* (Porter & Halliday, 2014), being scarce in Cumbria (recorded from not more than 30 tetrads). These were Cyperus Sedge and Rigid Hornwort and both were recorded by Porter & Halliday as being in the Lancaster Canal. Some of the native plants found in the southern lengths (VC60) are very much associated with the canal but tend to be sparse elsewhere in the vice county (Greenwood, 2012). These included Rigid Hornwort, Mare's-tail, Yellow Water-lily, Arrowhead and Flowering-rush. This highlights the importance of the canal as a habitat for water plants.

Some of the plants found in the canal are native but were beyond their natural range or had lately become regionally very uncommon or perhaps extinct; for example, Frogbit, Fringed Water-lily, Greater Duckweed and Greater Spearwort (Halliday, 1997; Greenwood, 2012). Now, however, they appear to be spreading. They may have been reintroduced or have escaped from garden ponds or water gardens. Additionally, Reed Sweet-grass is not widespread in North Lancashire and Greenwood (2005) expresses doubt about records from the canal; this plant was found at Lancaster in 2017 where it may be a recent coloniser.

Other plants found are aliens; these were Sweet-flag, Canadian and Nuttall's Waterweeds and New Zealand Pigmyweed. Sweet-flag has been naturalised in England since the 17th century and appears to have spread along the Lancaster Canal in the 19th century (Greenwwod, 2012).

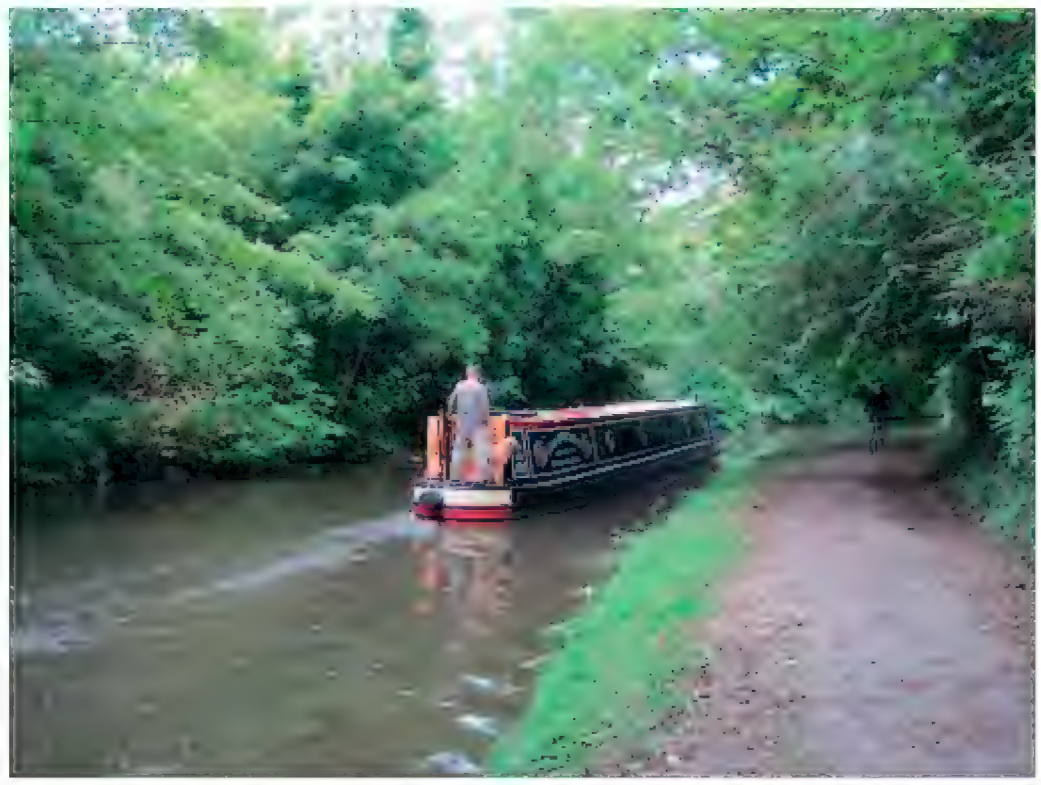

Figure 3. The Lancaster Canal at Carnforth, south of Tewitfield, September 2017. Turbid water, caused by boats, and tree shading have led to a dearth of aquatic vegetation.

Figure 4. The Lancaster Canal at Carnforth, south of Tewitfield, July 2016. Local stands of species-rich marginal vegetation are found; here emergent water plants Branched Bur-reed, Hemlock Water-dropwort and Greater Spearwort are seen with wetland plants Great Willowherb and Meadowsweet.

Greenwood also describes the colonisation of the canal by Canadian Waterweed in the 19th century and its replacement by Nuttall's Waterweed from around 1980. By 2016-2018 these two coexisted in the northern canal (Table 2, p47) but only Nuttall's Waterweed was found in the southern canal. Where both plants were found, Nuttall's Waterweed was usually much the more abundant, although in Length N5 both were recorded at >5% cover. The establishment of the highly invasive New Zealand Pigmyweed in the canal at Lancaster is recent; Greenwood (2012) reports it as scattered in North Lancashire although then apparently not yet in the canal.

The great abundance of water plants in the northern canal in 2016-2018 was very striking. It was evident that the waterway was eutrophic, having high biological productivity. The plants found tended to be indicators of nutrient-rich conditions. Ellenberg's N values (Hill, *et al.*, 1999) indicate the preference shown by plants for soil/water nutrient richness on a scale of 1 (preferring extremely infertile sites) to 9 (plants of extremely rich conditions). The nine plants that reached >5% cover in Lengths N1-N6 had average E_N=6.3 (range 5-7). Greenwood (2005)

suggests that sources of inorganic nutrients include run-off from surrounding land, inputs from colonies of gulls and geese and discharge of treated effluent to inflow streams. It is likely that a combination of high nutrient availability and clear water provides favourable conditions for photosynthesis by submerged plants, most notably Nuttall's Waterweed.

The much-reduced abundance of water plants in the southern canal was unlikely to be caused by any lesser availability of inorganic nutrients. It is most likely a result of boating. Greenwood (2005) is of this opinion and gives estimates from British Waterways for boat usage along the canal in 2000. These suggested that traffic exceeded 2000 boats per year throughout the navigable canal and in places reached 5000 per year. In the absence of locks (and lock-usage counters) it is difficult to estimate current traffic but it remains high. Canal & River Trust staff recorded 257 individual moored vessels along the canal in 2019, many of which are likely to ply to-and-fro. I have elsewhere reviewed the topic of plants and boats in canals (Goulder, 2019). Murphy & Eaton (1983) concluded that submerged plant biomass in canals is reduced beyond about 2000 boat movements per year (normalised to a $10m^2$ channel cross section). This critical value is, however, very approximate (Willby, 2000) and there may be substantial reduction in biomass at much less than 2000 movements per year (Eaton *et al*., 1989). Boats inhibit water plants by stirring up sediments, causing extreme turbidity that hinders light penetration and stops underwater photosynthesis. They also damage submerged, floating-leaved and emergent plants through mechanical damage caused by hulls and propellers, and by wash and backflow beneath and alongside moving boats. Nevertheless, It is evident that there are places along the southern canal where a botanically interesting marginal emergent flora persists (Table 3).

Comparison of water plants at Millness in 2016 with those in 2002 (Table 4, p51) demonstrated stability, since 15 out of 22 plants found in 2002 were still there in 2016 (and at least five of the apparently lost plants were found elsewhere in the canal in 2016-2018 – Table 2, p47). This agrees with Greenwood's (2005) review which suggests long-term stability; his Table 1 shows that 15 out of 24 JNCC checklist water plants recorded in the canal before 1910 were still there after 1998. Greenwood does, however, emphasise that there have been losses and gains in consequence of eutrophication. For example, between 1940 and 2000, losses of plants associated with nutrient-poor conditions included Lesser Water-plantain *Baldellia ranunculoides*, Shoreweed *Littorella uniflora* and Bogbean *Menyanthes trifoliata* while gains of plants suggestive of nutrient-rich conditions included Nuttall's Waterweed, Yellow Water-lily and Fringed Water-lily.

The great increase in abundance of water plants at Millness, between 2002 and 2016 (Table 4, p51) showed recovery of vegetation following the disruption of dredging. This was probably encouraged by there being only light boat traffic (i.e. the trip boat on summer Sundays) and clear water. Although dredging is always disruptive in the short term, there may be long term benefits to wildlife (IWAC, 2008). For aquatic plants these can include maintenance of deep water and control of encroaching emergent vegetation. An overview of the Huddersfield Broad Canal over the past 40 years has shown that diversity and abundance of water plants had the resilience to overcome the disruption of dredging c.20 years ago (Goulder, 2020). In the Lancaster Canal in the vicinity of Millness, the abundant and diverse vegetation found in the late 1960s (Goulder, 1970), although no longer there following dredging in 2001-2002, was similarly re-established by 2016. However, although there was notable continuity (Table 4)

there had been some dramatic changes. These included the loss of Soft Hornwort and gross colonisation by Nuttall's Waterweed.

Acknowledgements

CRT ecologist Diane Rollin participated in plant recording at Millness in August 2016; I am also grateful to her for the 2019 boat counts.

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Leaf-mining flies (Agromyzidae) new to the Yorkshire Diptera list: Part 2

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Introduction

Following Warrington (2017, 2018), eight species (one reinstated) of Agromyzidae are hereby added to the Yorkshire Diptera list. Five of these records are based on adult material collected/reared by the author (BPW), with the remaining three species being added to the Yorkshire list based on their distinctive larval mines (by BPW and Ian Andrews (IA)).

Agromyza intermittens (Becker, 1907)

A single female was collected by BPW from Broomfleet Washlands (VC61) on 24 May 2019. This fly was excluded from the Yorkshire list (Grayson, 2014) but is hereby reinstated.

Chromatomyia centaurii Spencer, 1990

Distinctive larval leaf mines (Fig. 1) were discovered by BPW on Common Centaury *Centaurium erythraea* at various locations in Hessle (VC61) during July 2019, with IA finding mines at Allerthorpe Common (VC61) on 25 August 2019.

Fig. 1. Larval mines of *Chromatomyia centaurii.*

Fig. 2. Mine and puparium of *Ophiomyia heringi.*

Ophiomyia heringi Stary, 1930

BPW collected external stem mines (Fig. 2) on sow thistles during July and August 2019, which resulted in adults been successfully reared. Puparia were obtained from various sites in East Yorkshire (VC61) with mines and puparia also being discovered at Thorne Community Wood (VC63). This is a relatively scarce leaf-mining fly; however, it is is probably overlooked.

Phytoliriomyza perpusilla (Meigen, 1830)
An adult male was collected by BPW on 13 September 2018 from a brownfield site in Hull (VC61). Although this insect is seemingly common throughout Europe, there are no records in the National Agromyzidae Recording Scheme database.

Phytomyza aconiti Hendel, 1920
Larval leaf mines were found on a garden *Delphinium* in Bridlington (VC61) on 27 June 2019 by BPW.

Phytomyza medicaginis Hering, 1925
Adult males were successfully reared by BPW from collected leaf mines (Fig. 3) on comfrey In Hessle during June 2019. Although other leaf-mining flies can form similar mines, examination of the male genitalia confirmed the causer.

Phytomyza stolonigena Hering, 1949
The characteristic larval leaf mines (Fig. 4) were discovered on Creeping Buttercup (*Ranunculus repens*) by BPW in 2017 Hull and 2019 Hessle.

Pseudonapomyza europaea Spencer, 1973
Adult males were collected from a brownfield site in Hull on 23/24 August 2019 by BPW. There is only one other record for this species in the National Agromyzidae Recording Scheme database (from Buckinghamshire), although it is common throughout Europe.


Fig. 3. Larval mine of *Phytomyza medicaginis.*


Fig. 4. Larval mine of *Phytomyza stolonigena.*

The following were discussed as additions to the Yorkshire list by Grayson (2019): *Liriomyza latigenis* (Hendel, 1920), *L. obliqua* Hendel, 1931, *L. yasumatsui* Sasakawa, 1972 and *Melanagromyza galegae* Warrington, 2019.

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Grayson, A. (2019) Additions and corrections to the Yorkshire Diptera list (part 8). *The Naturalist* 144: 144-151.

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Warrington, B.P. (2018) Leaf-mining flies (Agromyzidae) new to the Yorkshire Diptera list. *The Naturalist* 143: 31-33.

Additions and corrections to the Yorkshire Diptera list (part 9)

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Introduction

With this latest batch of additions and corrections, the Yorkshire Diptera list currently stands at 4,435 species, which is almost 62% of the current British total of 7,193 species (Chandler, 2020). These Diptera totals fluctuate continually as additional species are discovered and corrections are made, but the overall movement is a gradual increase in the number of species on both lists.

The current Yorkshire total represents a remarkable recording effort by relatively few workers during the past two hundred years, but there are inevitably some families and groups of Diptera which have only been studied by a few specialists and in which many more Diptera species surely await discovery.

Whilst this paper was in preparation, the writer was saddened to hear that Gavin Boyd had succumbed to his recent terminal illness (see p66). Gavin was a regular contributor of Yorkshire Diptera records over recent years and a true gentleman who will be fondly remembered by all who knew him.

Amongst emails received by the writer during 2019, Gavin provided a photograph of the spectacular hoverfly *Volucella zonaria* (Poda, 1761) (Syrphidae), which visited his garden in Dalton (Huddersfield) during August. This relatively recent arrival to Yorkshire was also photographed in their gardens during 2019 by Ivan Nethercoat in Beverley, Jan Nobel in Heslington and David Smith in Cottingham. It was also photographed in Wheatley Hills Allotments (SE595061) by Andrew Hill on 04.08.2019 (Bob Marsh, pers. comm.) and reported from Cali Heath (SE751496) on 25.07.2019 by Jen Stopford (Phillip Whelpdale, pers. comm.).

The large horsefly *Tabanus autumnalis* Linnaeus, 1761 (Tabanidae) has also recently spread northwards into Yorkshire, and is now known as far north as Filey Dams (TA1073580774), from where a female was photographed by Daniel Lombard on 09.08.2019. This locality borders VC62, but the precise Ordnance Survey National Grid reference allows the record to be placed in VC61.

Unfortunately, the luxury of such a precise O.S. National Grid reference is rarely available for localities which adjoin or overlap vice-county, or county borders. One such borderline locality is Tailbridge, from where Disney *et al*. (1981) reported many scuttle-fly (Phoridae) species which were taken by pitfall trapping between 1976 and 1978. These Tailbridge species all appear as VC65 (North West Yorkshire) records on the YNU record cards and were therefore all included in the assessment which produced the online provisional list of Yorkshire Diptera (Grayson, 2015). It has since been realised that two of the four Tailbridge trapping locations mentioned by Disney *et al*. (1981) (NY810042 & NY810043) lie entirely within VC69 (Westmorland); therefore, any Tailbridge scuttle-flies recorded from those squares cannot be claimed from Yorkshire, even though it is likely that they also occurred on the adjacent land in VC65. The

other Tailbridge 100m square trapping locations mentioned by Disney *et al*. (1981) (NY811042 & NY811043) overlap the county border, and could have been in either, or both, counties.

Although Tailbridge is of some importance to the Yorkshire Diptera list, a far more significant and problematic border issue occurs with many records from the Sheffield area. Unless accompanied by an O.S. National Grid reference, or specified as being on the Yorkshire side of the boundary (VC63), biological records from 'Sheffield' were always problematic due to a sizeable part of the city being in the traditional county of Derbyshire (VC57). This problem was made worse when the 'Derbyshire' side of Sheffield was transferred to the new county of South Yorkshire in 1974, and further exacerbated when many biological journals and books adopted modern county names in place of traditional Watsonian vice-county system names; thereby disregarding and damaging the system's acknowledged value for maintaining stability and facilitating continuity in national biological recording.

In short: any biological records from 'Sheffield' or 'South Yorkshire' must be treated with caution if no precise locality details are available; for the records may, and often do, refer to Derbyshire (VC57). This problem is particularly relevant to Tom Ford's Tachinidae records. Tom sustained a long interest in breeding these parasitic flies, mainly from lepidopterous hosts, and was the author, or main author, of five papers which are of significance to our knowledge of Yorkshire Diptera, viz. Ford (1973, 1976 & 1989), Ford & Shaw (1991) and Ford *et al*. (2000).

These otherwise detailed and quality papers unfortunately include only vague locality details. This is particularly problematic with Tom Ford's records from 'Sheffield', 'South Yorkshire', or 'the Sheffield area': none of which can be trusted to derive from VC63; and most, if not all, of which may be from VC57. Given that, throughout the period of his papers, Tom Ford's home was in Ashbury Drive, Sheffield, which is in VC57, and between 2km and 3km from the nearest parts of VC63; it would be more likely that his 'Sheffield' records would refer to VC57. His unpublished Tachinidae records within the YNU cards also give rudimentary locality data only.

Recent correspondence included Ian McDonald providing an interesting record by virtue of a photograph taken of a small fly at Thorne Moors on 15.08.2019. This was *Acletoxenus formosus* (Loew, 1864) (Drosophilidae), for which the only previous county record was in Grimshaw (1914).

Jim Horsfall forwarded invertebrate lists from Malaise trapping carried out at Potteric Carr and Carr Lodge during 2019, partly in order to continue discussions and obtain opinions on the results; which, as with the Potteric Carr invertebrate list for 2018, were produced by DNA metabarcoding technology. As with the previous year, this technique mainly produced species which would be expected to occur at Potteric Carr, plus a few suspect identifications, including odd species not known from Britain.

The following lists of county additions and corrections, etc., include several references to the aforementioned Tailbridge localities of Disney *et al.* (1981) and Tom Ford's Sheffield localities. Some other historic records are published here for the first time, together with Diptera records from recent years.

The lists give full surnames for recorders, etc., who are mentioned once only. Those persons

who are mentioned multiple times are abbreviated to the following initials: Ian Andrews (IJA), Peter Chandler (PJC), John Coldwell (JDC), Henry Disney (RHLD), Bill Ely (WAE), Andy Godfrey (ANRG), Andrew Grayson (AG), Julian Small (JOHS) and Peter Skidmore (PS).

The lists omit O.S. National Grid references for Julian Small's static Wheldrake Rothamsted Trap no.644 (SE69104475) and Ian Andrews' North Cave Wetlands centrum (SE883328), as these localities are mentioned multiple times.

Additions and re-instatements to the Yorkshire Diptera list

MYCETOPHILIDAE

Anatella setigera Edwards, 1921: VC64: Malham Tarn (Tarn House lawn) (SD894672) 20-22.09.1980, RHLD, det. PJC; Sawley, near Ripon, 04.09.1904, F. Jenkinson, det. PJC: VC65: Kisdon Force (NY896010) 05.10.1985, I.F.G. McLean, det. PJC; River Swale, Marske (NZ115005) 17.05.1972, J.H. Cole. This nationally Common fungus gnat would appear to have escaped previous publication as a Yorkshire insect.

PSYCHODIDAE

Paramormia polyascoidea (Krek, 1970): VC61: Wheldrake Rothamsted Trap, 03.08.2015, (1) JOHS.

CHIRONOMIDAE

Chironomus* (*Chironomus*) *commutatus Keyl, 1960: VC61: Wheldrake Rothamsted Trap, 03.06.2013, (1) JOHS. This midge was provisionally excluded from the county list in the previous report (Grayson, 2019).

Paratrichocladius nigritus (Goetghebuer, 1938): VC61: Wheldrake Rothamsted Trap, 17.02.2012, JOHS.

PLATYPEZIDAE

Agathomyia falleni (Zetterstedt, 1819): VC61: Cali Heath YWT Nature Reserve (SE751498) 05.10.2019, (♂ & ♀ taken from Sycamore *Acer pseudoplatanus*) IJA: VC63: Silkstone Wagonway (SE2906) 17.09.2019, (♂) JDC.

PHORIDAE

The scuttle-flies *Triphleba distinguenda* (Strobl, 1892) and *T. intermedia* (Malloch, 1908) were thought to be already reported from Yorkshire due to records from the borderline locality Tailbridge in Disney *et al.* (1981); however, the trapping location (NY810042) was entirely within VC69 (Westmorland). Both species remain on the Yorkshire list on the basis of the following previously unpublished records.

Triphleba distinguenda (Strobl, 1892): VC62: Keld Head, Pickering (SE787844) 02.08.1987, (♂) G.J. King: VC63: Warren Vale (SK440976) 15.09.2002, (several ♂) WAE: VC64: recorded by RHLD from three areas around Malham Tarn, viz. at the windows of Tarn House (SD893672) on various dates during 1975; High Scree Wood (SD894673) during 06.1975; and Ha Mire Wood (SD897665) between 02-03.06.1982 (abundant).

Triphleba intermedia (Malloch, 1908): VC64: High Scree Wood, Malham Tarn (SD894673) 04-05.05.1983, (♂ ex yellow water trap) RHLD.

SYRPHIDAE

Eumerus ornatus Meigen, 1822 is restored to the Yorkshire list on the basis of ANRG's 02.06.2019,

VC61 record of a singleton from the part of the former North Selby Mine which includes areas west and north of the mine buildings and areas of hardstanding (centrum SE6467844234). This hoverfly was formerly excluded by Grayson (2006a).

LONCHAEIDAE

Lonchaea palposa Zetterstedt, 1847: VC61: North Cave Wetlands YWT Nature Reserve, 30.08.2019, (2♂ swept from poplar) IJA (teste Iain MacGowan).

LAUXANIIDAE

Homoneura consobrina (Zetterstedt, 1847) was restored to the British list by Gibbs (2005) and can now be restored to the Yorkshire list on the basis of a sensu stricto ♂ taken by WAE from VC61: Thorpe Hall, Rudston, near Bridlington (TA108674) on 15.07.1989. The specimen was re-identified by WAE using a key produced by Stephen J. Falk, which includes drawings of *Homoneura* male genitalia. Other Yorkshire records of *H. consobrina* (all pre 1992) may refer to *H. patelliformis* (Becker, 1895) or *H. tesquae* (Becker, 1895); hence must be now considered as *H. consobrina* sensu lato, including the first published Yorkshire record (Ely, 1991), for which the voucher specimen is no longer extant (WAE, pers. comm.).

Homoneura interstincta (Fallén, 1820) sensu stricto: VC63: Dodworth Tip (SE3105) 03.08.2019, (♀) JDC; Dunford Bridge (SE1502) 17.07.2019, (♀) JDC.

HELEOMYZIDAE

Eccoptomera obscura (Meigen, 1830): VC61: Cali Heath YWT NR (SE751498) 29.10.2019 (♀), 10.11.2019, (♀) IJA.

ANTHOMYIIDAE

For much of the 20th Century, *Botanophila discreta* (Meigen, 1826) was considered to be a junior synonym of *B. striolata* (Fallén, 1824). It has since been recognised by the foremost authority Verner Michelsen as a distinct species, although it is possible that females cannot be reliably separated from those of *B. striolata*. In the male sex, *B. discreta* has a much broader frons than *B. striolata*, as was illustrated by photographs in Brighton (2019a), and described by Ackland & Bratton (2013), which also gave other subtle differences between the males, although the width of the frons would appear to be the most reliable diagnostic character. From the material I have seen: in *B. discreta* males, the narrowest point of the frons is clearly broader than the width of the third antennal segment, and slightly broader than the distance between the outer margins of the two upper ocelli; whereas, in *B. striolata* males, the narrowest point of the frons is narrower than the third antennal segment, and much narrower than the distance between the outer margins of the two upper ocelli.

The raising of *B. discreta* to specific rank from synonymy of *B. striolata* as per Ackland & Bratton (*loc. cit.*) automatically causes all Yorkshire *B. striolata* records to be considered as *B. striolata* sensu lato or *B. striolata/discreta* until such time as any extant male specimens are re-examined. A recent re-examination of male specimens in their private collections by AG and JDC produced the following results:

Botanophila discreta (Meigen, 1826): VC63: Cawthorne (old hedgerow/copse) (SE2808) 08.05.2010, (♂) JDC; Low Barugh Canal (overgrown canal) (SE3208) 21.04.2011, (♂) JDC: VC64: Brimham Rocks (woodland edge) (SE2078265478) 29.08.2019, (♂) AG.

Botanophila striolata (Fallén, 1824) sensu stricto: VC62: Raindale (woodland edge) (SE806935) 12.04.1990, (♂) AG: VC63: Low Barugh Canal (old canal/waste ground) (SE3206) 21.04.2010, (♂) JDC.

The combined historic Yorkshire records of *B. striolata/discreta* were from 20 separate sites spread throughout the five vice-counties. The first record was R.H. Meade's *Chortophila striolata* from Bolton Bridge in 1875, which was published by Ashworth & Cheetham (1920). The first record of *B. discreta* was published sub nom. *Chortophila discreta* by Fordham (1927), and was of two females collected at Allerthorpe Common during June 1926 by W.J. Fordham, determined by J.E. Collin. There was one further historic record of *B. discreta* before it was sunk in synonymy with *B. striolata*.

Adia cinerella (Fallén, 1825) has been recorded from: VC63: Bentley Common, 25 emerged from cow-dung between 06-10.07.1976, PS, and ♀ swept on 25.08.1976, PS; Chesterfield Canal (SK5182) 31.05.1981, (♀) WAE; Greasbrough Dam (SK4196) 25.10.1987, (♀) WAE; Silkstone (old hedgerow/copse) (SE2906) 07.2010, JDC: VC64: Swarth Moor (a.k.a. Helwith Moss) (SD8069) 31.09.1985, R.S. Key, det. PS: VC65: Cordilleras, Feldom (NZ0903) 18.08.1990, WAE.

These records have not been published previously; in part because *Adia cinerella* was long assumed to be already known as a Yorkshire insect. This was on the basis of 3♂ taken near Bradford (Meade, 1882); however, this was a subsequent misinterpretation by others, as Meade (1882) did not equate his specimens with *A. cinerella* (Fallén's *Musca cinerella*). Instead, he referred them to *Hylemyia cinerella* of Meigen (not Fallén), which Meade (1882) correctly stated was confused by Meigen and was distinct from Fallén's *Musca cinerella*. Meade's specimens from near Bradford were therefore not referable to *A. cinerella*, as can be confirmed by his description of Meigen's *H. cinerella* in Meade (1882), which does not properly equate with Fallén's species.

MUSCIDAE

Thricops foveolatus (Zetterstedt, 1845): VC61: Wheldrake Rothamsted Trap, 26.08.2015, (1) JOHS.

TACHINIDAE

Actia infantula (Zetterstedt, 1844): VC61: North Cave Wetlands YWT NR, 16.07.2019, (♂ swept from lakeside vegetation), IJA.

Bactromyia aurulenta (Meigen, 1824): VC63: Barrow Colliery (SE353028) 2 adults bred from Pebble Hook-tip moth *Drepana falcataria* caterpillars in 2017 by J.D.H. Brown, det. JDC (1♀ retained by JDC).

Carcelia* (*Carcelia*) *puberula Mesnil, 1941: VC63: Dodworth (trees near grass verge by garden) (SE3105) 06.06.2019, (♂) JDC.

Linnaemya* (*Ophina*) *picta (Meigen, 1824): VC61: Allerthorpe Common (SE752477) 18.08.2019, IJA (teste Chris M.T. Raper). This was confirmed by examination of male genitalia. 20 individuals were counted in the field, of which 5♀ and 2♂ were taken. More were present on heather at the coniferous wood edge (IJA, pers. comm.); North Cave Wetlands YWT NR, 30.08.2019, (more than 20 seen in the field, ♂ & ♀ retained) IJA; Three Hagges Woodmeadow (transect walk section T6: York Road) (SE6252539357) 04.09.2019, (♀) AG. This parasitic fly has spread rapidly in Britain since Bentley & Raper (2010) reported its discovery in Kent, including giving some earlier records. Its occurrence in Yorkshire was imminently expected, particularly after it was found close to the Yorkshire border at Sandtoft (SE7542008753) in VC54 (North Lincolnshire) on 08.08.2019 by AG.

Mintho rufiventris (Fallén, 1817): VC61: former North Selby Mine, plantation woodland and open mosaic habitats (Centrum SE6498344095) 02.06.2019, (1) ANRG.

Exclusions from the Yorkshire Diptera list

MYCETOPHILIDAE

Mycetophila dziedzickii Chandler, 1977 = *obscura* Dziedzicki, 1884, preocc. is best provisionally excluded from the Yorkshire list pending confirmation of its occurrence in the county. It was recorded sub nom. *Mycetophila obscura* from the YNU VC62 excursion to Pickering between 04-06.06.1938 (Cheetham, 1938); but there are no voucher specimens in C.A. Cheetham's main collection at Leeds Museum Discovery Centre, nor amongst his other material held in provincial museums elsewhere, nor apparently in The Natural History Museum in London, as no Yorkshire records were mentioned by Falk & Chandler (2005). Provisional exclusion is further advisable as this species was confused with *M. lunata* Meigen, 1804 before the review by Chandler (1977). *M. lunata* has subsequently proven to be the commoner of the two species nationally (based on records from recent decades) and has been recorded in Yorkshire by PJC, JDC and PS.

PHORIDAE

Megaselia angelicae (Wood, 1910) has long been on the Yorkshire list on the basis of material identified by RHLD from ten pitfall traps sited at Tailbridge (NY810042) between 1976 and 1978 (Disney *et al*., 1981); however, this borderline 100m² is entirely within VC69 (Westmorland).

EPHYDRIDAE

Hydrellia pubescens Becker, 1926 = *nasturtii* Collin, 1928 was included in the Yorkshire list on the basis of Collin's 21 *Hydrellia nasturtii* syntypes being labelled from Yorkshire, Leeds, having been bred by T.H. Taylor of Leeds University from larvae found mining the stems of Water-cress *Nasturtium officinale*; however, Pont (1995) stated "Although all these syntypes are labelled from Leeds, that is merely the place where they were reared by Taylor (1928: 126) who wrote: 'In the watercress that comes to Leeds from the South during January and February …'. The type-locality should therefore be given as 'South England'."

ANTHOMYIIDAE

Anthomyia pluvialis (Linnaeus, 1758) = *ignota* (Rondani, 1866) requires provisional exclusion from the county list, as it is likely that all Yorkshire records refer to *A. procellaris* Rondani, 1866. Records thought by Grayson (2007) to refer to *A. pluvialis* are now suspect following recent examination by AG of a ♂ from VC62 Clifton, York (SE5954) 09.05.1990. This specimen was listed as *A. pluvialis* in Grayson (2007), but its genitalia clearly diagnose *A. procellaris*.

Delia penicillosa Hennig, 1974, principally a coastal dune species, was included in a circulated list from Nosterfield Nature Reserve 2018; however, the species recorded was actually *Delia criniventris* (Zetterstedt, 1860) (ANRG, pers. comm.). This anomaly occurred because *D. penicillosa* was proposed as being synonymous with *D. criniventris,* but apparently is not – see notes in Ackland (2010) and Brighton (2019b). Regardless, ANRG's discovery of *D. criniventris* at Nosterfield on 19.07.2018 is somewhat noteworthy, as it constitutes the first VC65 record, and only the fifth Yorkshire record since this fly was first reported by Meade (1882) sub nom. *Hylemyia tibiaria*.

MUSCIDAE

Helina concolor (Czerny, 1900) is best provisionally excluded from the Yorkshire list, as the only record, viz. VC64 Malham Tarn (tarn edge) 07.1972, leg. & det. Mrs. E.C. Broadhead, which was in part published by Grayson (2006), is unsupported by voucher material in either her collection held at Leeds Museum Discovery Centre or the large cabinet of Malham Tarn invertebrates held

at Malham Tarn Field Centre. *H. concolor* is a nationally uncommon fly which was given RBD3 status in Shirt (1987) and Falk (1991); revised to provisionally Nationally Scarce status by Falk & Pont (2017).

TACHINIDAE

Admontia seria (Meigen, 1824) = *decorata* (Zetterstedt, 1859) was included in error in the online provisional list of Yorkshire Diptera (Grayson, 2015) due to misinterpretation of a record sub nom. *Trichoparia seria* from Farnley 17.07.1922 in Cheetham (1926), which actually refers to *A. maculisquama* (Zetterstedt, 1859) = *seria* sensu auctt., nec (Meigen, 1824).

Blepharomyia piliceps (Zetterstedt, 1859) was recorded from Fox House, Sheffield, South Yorkshire by Ford *et al*. (2000); but Fox House lies well within VC57 (Derbyshire).

Acknowledgements

Aside from those persons already mentioned within this report, the following also deserve acknowledgement for their Diptera contributions to the author during the past year or so in the form of occasional records, photographs and correspondence: Bill Dolling, Paul Holmes, Geoff Oxford, Gill Smith, Rhona Sutherland, Ken and Sarah White and Nicola Woosnam. Nick Hall forwarded Andy Godfrey's invertebrate report on the former North Selby Mine. This provided two additions to the county Diptera list, for which gratitude is due to Andy Godfrey for granting permission to publish relevant details within this report.

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Obituary: Gavin Boyd 1940-2020

Gavin's interest in natural history began when he was first living in Leeds and a neighbour who was keen on butterflies infected Gavin with his enthusiasm. He joined Leeds Naturalists' Club, an affiliate of the YNU, in 1981 and by the late 1980s was Treasurer and Lepidoptera Recorder. He was elected President for 1990 and for his Presidential Address, *Eight Years with an Open Window*, gave an account of the moth species recorded when he left his bedroom window open with the light on for a fixed number of hours before closing it and recording the catch!

Gavin, born in Chester, studied civil engineering at Nottingham University, and it was his subsequent job with Yorkshire Water which brought him first to Leeds. He transferred to Anglia Water in the early 1990s and moved south, first to Cambridge and then Northampton. He maintained his entomological friends in the north and in 1995, along with three others, including Harry Beaumont, YNU Microlepidoptera Recorder, embarked on the first of nine successive years of entomological expeditions to France. Gavin's absence from the 10th Anniversary trip was because, by then, he had met Annie, his future wife. During this time he became an active member of the British Entomological and Natural History Society, for which he was the Society's Sales Secretary. Gavin was not particularly enthralled by modern technology and, during his time volunteering for the BENHS, kept meticulous and accurate paper records of the sales, which also involved wrapping all books sold and almost daily trips to the post office. Throughout his period 'down south' Gavin loyally maintained his membership of Leeds Naturalists' Club and so slipped easily back into the Club's activities when he returned north to live in Huddersfield in 2011, joining the YNU at about that time. He regularly attended both indoor meetings and field trips until autumn 2019 when his final illness intervened. His records from the recent Leeds Nats Field trips contributed a significant amount of the material for the Club's newsletters.

Gavin's original interest in butterflies had broadened considerably enabling him to develop an expertise in entomology generally, which was much admired by all who knew him. He will be remembered as invariably polite, considerate and self-effacing but with a ready wit and a willingness to help whenever he could, showing patience and understanding, particularly when encouraging newcomers to the study of insects.

AM

John Bowers

We were very saddened to learn that John Bowers, a key member of *The Naturalist* Editorial Board and former Chairman of the YNU Executive, died on 23rd January. Our deepest sympathies go out to his family. His many contributions to the YNU will be sorely missed. A full obituary will appear in a future edition of *The Naturalist*.

Notes on the genus *Rhaphium* Meigen, 1803 (Diptera:Dolichopodidae) in Yorkshire

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There are currently 26 *Rhaphium* species on the British List (Chandler, 1998), of which 21 have been reported in Yorkshire. The genus contains 4 Nationally Rare (NR) and 10 Nationally Scare (NS) species (Drake, 2018). These re-defined criteria equate to the 'Red Data Book' (RDB) statuses, and 'Nationally Notable' (Nb) in the most recent previous review (Falk & Crossley, 2005). Of the 21 Yorkshire species one is NR and eight are NS.

Rhaphium species are mostly various shades of metallic-green, ranging in size between 3mm and 6.5mm. Most males have distinctive characters, such as external genitalic adornments or conspicuous leg-bristling, which make positive identification easy, but some females are difficult, if not impossible, to identify with certainty. Most species are to be found in wetland situations, including the margins of flowing water, but, as far as I am aware, life-histories are unknown. Few can be described as being 'widespread' across Yorkshire, the majority being 'localised' given the present state of knowledge, and with three being known from single localities only.

Rhaphium albomaculatum (Beck.). C.A.Cheetham recorded this species from Austwick in 1923, and the following year from Whernside. It was then found by him at Thorner (undated), and Clapham Wood in 1932 (all VC64). It was not until 1974 that it was again reported, this time by the River Swale at Marske (VC65) by a visiting dipterist, J.H. Cole. Since then it has been recorded from a total of 20 hectads widely spread across the northern half of the County, with no records yet from VC61 and only a single site in VC63, Firbank Hall in the extreme south (12 May 1982, W.A. Ely).

Rhaphium antennatum (Carlier) (NS). The first County record was reported at Spurn in Hincks (1953) where 2 males were found on 12 July 1952 at 'the pond in the *Phragmites* area' (this was near the Warren and it succumbed long ago to coastal erosion). Another male was found three days later on the 'saltings'. Interestingly, Dr. W.D. Hincks, who compiled the Diptera section of the Spurn report, comments:-'The few British records of this species show it to be confined to coastal marshes'. Verrall refers to it as 'very rare' (for many years in the late 19th and early 20th centuries G.H. Verrall was the leading British dipterist.). The next record was from Mickletown Ings (VC64) where a single male was swept from *Phragmites*, 27 July 1976 (P. Skidmore). From 1990 onwards there have been numerous scattered records from sites in the Lower Derwent Valley (VC61), and two sand and gravel pits: North Cave Wetlands (VC61) and Nosterfield (VC65), the latter being the farthest west. There are now records from sites in 10 hectads.

Rhaphium appendiculatum Zett. First reported from Burley-in-Wharfedale (VC64) in 1899, this is the most numerous and widespread member of the genus, with records extending from Spurn to Teesdale. As with most similarly common dolichopodids there does not appear to be any clear habitat association. Although the males are easily identified by their distinctive external genital appendages, I am not convinced that females are separable from the closely similar *R.caliginosum*.

Rhaphium auctum Lw. First recorded in Yorkshire at Hawnby (VC62) 18 July 1978 by J.H. Cole, it has been found from 1984 onwards at sites in a total of 15 hectads across the County, but there are no reports from VC65. There is a pronounced, but not exclusive, association with calcareous wetland localities.

Rhaphium brevicorne Curtis. Cheetham reported this at Carperby (VC65) on the occasion of the 1931 Whitsuntide meeting of the Y.N.U., where he found it 'sweeping about the Thrift' (Cheetham, 1931). It was fifty years before the species was again reported in the County when Peter Skidmore found a female at Middleton-in-Teesdale (VC65) on 21 June 1981, and four days later 2 females on *Potentilla fruticosa* L. below the falls at High Force. Subsequently there have been reports from localities in all five vice-counties in about twenty scattered hectads. No clear habitat association can be detected; my own records include such varied habitats as South Pennine moorland at 1,200', peatland at Hatfield Moor, soft coastal cliffs at Sewerby and the bank of the River Wharfe downstream from Otley.

Rhaphium caliginosum Mg. A record of this species from Nab Wood (VC63) made by R.H. Meade in 1880 (Ashworth & Cheetham, 1920) is amongst the earliest of Yorkshire dolichopodid records. The next was in May 1921 at Crag Wood (VC63) by C.A. Cheetham. Dr. Meade was a Bradford surgeon and he was an early worker on arachnids as well as diptera. Cheetham reported the species at Fairburn (VC64) in June 1934, and at Stocksmoor (VC63) in 1942. Apart from an undated record (but probably pre-1978) from Sykehouse (VC63) by Peter Skidmore, it was not until 1980 that records started to be made in quantity from across Yorkshire, and it can now be described as 'widespread and with no obvious habitat association'. However, a curious feature of the distribution map is that there is no record from the western quarter of the County, a region which contains numerous well-worked sites over the years, including Cheetham's favoured Austwick district, and the well-worked Malham area.

Rhaphium commune (Mg.) This seems to be scarce in Yorkshire, the first discovery being reported by Chris Cheetham in the account of the visit of the YNU to 'Coxley Valley' 25 June 1925 (Cheetham, 1925). It is likely that the locality, which is not named on modern maps is, in part or whole, the Yorkshire Wildlife Trust Stoneycliffe Wood reserve, (VC63), south-west of Wakefield. A second record is from Howell Wood, near South Kirby (VC63), by P. Skidmore; this is undated but it is likely that it was prior to 1978, the year in which the Royal Entomological Society Dolichopodid 'Handbook' was published. The identification was made by the author of that work, Mr. E. A. Fonseca, with whom the late Dr. Skidmore had contact. There were no further Yorkshire records until 1991 when I took 2 males and 1 female at Rievaulx (Terrace Bank Wood), on 20 June. In 1994 I found a male on the bank of the River Rye in Duncombe Park, downstream from Rievaulx, on 24 June, and a further specimen at Ashberry less than a kilometre away from Rievaulx, on 8 July 2006. The environments of this rather tight cluster of sites in VC62, are calcareous flushes or flowing water of sorts. Finally, I found the species in 2009 and 2010 at Ellington Banks Military Training Area, west of Ripon (VC64), another site with calcareous flushes.

Rhaphium consobrinum Zett. Cheetham was familiar with this species (see Figure 1, p69), having found it at Grange-over-Sands in 1923, and at Humphrey Head in August 1938. Possibly the two refer to the same area at the head of Morecambe Bay where he spent cycling and camping holidays. He does not appear to have found it at Yorkshire sites, and it was not until 1975 that the first County example was reported from Blacktoft Sands (VC63), at the confluence of the Rivers Ouse and Trent. This again was a Skidmore record 'det. Fonseca'. I found it on

a sand/shingle bank on the River Wharfe east of Otley (VC64) in 1986, having taken it further downstream at East Keswick Fitts two years previously. Since then I have found it at brackish sites, including a dyke near Beacon Ponds, Kilnsea (VC61), inland as far as East Clough to the west of North Ferriby (VC61), and Ian Andrews has recently found it at Broomfleet (VC61). In these Humber sites it is one of the most abundant dolichopodids to be found when sweeping the stretches of linear salt-marsh vegetation which narrowly border the tidal muddy foreshore. I have also found it at North Cave Wetlands, and at Jeffry Plantation bordering the River Derwent west of Malton, (both VC61), and also on the River Rye at Harome (VC62), downsteam from Helmsley. In all, there are records from sites in 13 hectads and often an association with river systems.

Figure 1. Males of *Rhaphium consobrinum* (left) and *Rhaphium crassipes* (right).
Photos © P.Cayton

Rhaphium crassipes (Mg.) See Figure 1 above. Widely distributed across the County, with the familiar pattern of early 1920's records from the usual collecting areas of that time, i.e. Allerthorpe (VC61) (W.J.Fordham); Austwick/Crag Wood/Grass Woods (all VC64) (C.A.Cheetham). It was not until the 1980s that more extensive recording began, and it is now known from sites in more than fifty hectads across Yorkshire. However, the only coastal records are from Speeton Cliffs and Danes Dyke (both VC61) and there is a complete lack of records in Holderness and along the Humber. Many localities are wooded with streams or flushes.

Rhaphium elegantulum Mg.(NS). This large (6-7mm) metallic purple and green fly is one of the more striking species of the genus, and is unlikely to be overlooked. The only County record prior to 1976 was from Snape Mires, Bedale (VC65) on the occasion of the YNU 1923 August Bank Holiday meeting at Leyburn (Cheetham, 1923). The next record was from Hooton Roberts (VC63) on 8 July 1967, and thereafter at about six further VC63 sites in a cluster of 4 hectads. In the County as a whole it has now been recorded from widely scattered localities in 17 hectads, with representatives in all five vice-counties, but it is unreported from the upland western quarter of Yorkshire or any coastal localities. Many sites are the margins of shallow ponds with emergent vegetation.

Rhaphium fasciatum Mg. (NS) Very localised, with records from 15 hectads widely scattered across Yorkshire. The first report was from Askham Bog (VC64) by K.G. Payne in 1953; ten years later it was recorded at Malham Tarn (VC64) by Alan Bridle, and further records followed from 1980 onwards. The only VC63 record is from Inkle Moor, Thorne, 25 June 2012 (A.Godfrey).

Raphium fractum Lw. (NS) is only known in the County from the bank of the River Wharfe downstream from Otley (VC64), where I found 2 males and 1 female 20 July 1985, and 2 females 18 June 1986.

Rhaphium lanceolatum Lw. (NS) The only Yorkshire record is from Wharfe Wood (Austwick) (VC64) where Chris Cheetham found it on 1 July 1932. Two males taken on that date are in the collections of Leeds City Museum, and I confirmed the identification some sixty years later (Crossley, 1992).

Rhaphium laticorne (Fall.) There are few Yorkshire records for this, the first being from Treeton Dyke (VC63), 29 July 1981, *leg*. W.A. Ely, det. RC, and the second on the occasion of the Y.N.U. visit to Acaster Malbis, (VC64), 1 June 1985, RC. Thereafter *laticorne* has been reported in a further eight hectads at sites which include gravel-pits and river banks.

Rhaphium longicorne (Fall.). One of the larger members of the genus and with conspicuously long antennae, this is an unmistakable species, and not likely to be overlooked in the field. Moreover, it appears to be confined to moorland peat and bog habitats, such as Tarn Fen, Malham (VC64), from where it was first reported in the County by H.M. Russell, 23 July 1956, and Goathland (VC62) where Mr. Russell reported the second occurrence in August 1960. It has now been reported from a total of ten hectads in the uplands of the Pennines and North York Moors. There are two puzzling aspects about the presently known distribution of this species in Yorkshire. How can it possibly have been overlooked by earlier dipterists, and why does it not appear to occur on lowland bogs such as Austwick Moss (VC64), a favourite locality of Chris Cheetham, and the massive tracts of Thorne and Hatfield Moors, which have been assiduously worked by dipterists from the 1960's onwards? It is well known that insects of upland peat bogs often occur in similar habitats at low altitudes and there are numerous examples of this phenomenon, and not only amongst diptera.

Rhaphium micans (Mg.) (NS) Cheetham recorded the first Yorkshire example at Bubwith (VC61) 25 June 1937 with no further details. It was found thirty years later (18 July 1967) at Blaxton Common (VC63) by P. Skidmore (det. E.A. Fonseca), and has not been reported since then.

Rhaphium monotrichum Lw. A common and widely distributed species, the County records follow a typical historical recording pattern. First reported by Cheetham from 'Coxley Valley' (VC63) 25 June 1925, he next found it at Norber (VC64) 22 June 1932. Those remained the only Yorkshire records until 1963 when it was reported from Malham Tarn (VC64) by Alan Brindle. In 1979 it was found at Maltby Common (VC63) 14 July 1979 by W.A. Ely, and the following year at Ashberry (VC62) by P. Skidmore. The species has now been reported at sites in a total of almost forty hectads across Yorkshire in a range of habitats, but there is no record from a coastal site.

Rhaphium nasutum (Fall.) (NS) J.E. Collin was the nephew of H.G. Verrall, and following the latter's death in 1911 he inherited his uncle's collection of diptera and the mantle of the leading British dipterist of his generation, until his own demise in 1968. 'J.E.C.' assisted many dipterists, and in 1921 he confirmed the first recorded Yorkshire example of this species which had been taken by Dr. W.J. Fordham at Bubwith (VC61) (undated, but possibly in that year). I have found

it at Wheldrake Ings (VC61) upstream from Bubwith on several occasions since 1990, and Mr A. Godfrey has also reported it from there. I also took it at sites in the Otley area (VC64) in the 1980's (a marsh at the head of Lindley Reservoir, the bank of the River Wharfe downstream from Otley and at East Keswick Fitts). The most recent record is from the bank of the River Rye near Harome (VC62) downstream from Helmsley, 22 July 2008 (RC).

Rhaphium patulum (Raddatz) (NR) The sole Yorkshire record is from 1976 when a single male was collected by P. Skidmore 'on a muddy bank' by the River Don at Fishlake (VC63), on 3 July (Skidmore, 1977).

Rhaphium riparium (Mg.) A Cheetham record from Denton Wood (VC64) 6 July 1946 was the sole County example until July 1977 when it was reported from Colsterdale (VC65) by W.A. Ely. Records came in quantity thereafter in the other vice-counties except for VC61 when I found it at Houghton Wood in 1998. It has now been found at sites in 33 hectads, and in a varied range of habitats.

Rhaphium rivale (Lw.) (NS) Apparently scarce in Yorkshire and first recorded by me at Timble Ings, Otley (VC64) 18 June 1982, there have been subsequent records from the river Don, Rotherham (VC63) 18 May 1992 *leg*. W.A. Ely *teste* RC, North Cave Wetlands (VC61), Lady Spring Wood by the River Derwent (VC62), Cromwell Bottom by the river Calder (VC63), and at various sites along the river Wharfe downstream from Otley (VC64), one of them being river shingle. All these are my records, ranging in dates between 1984-2014.

Discussion

A clear historical pattern of recording applies to these flies, and the situation almost a century ago was summarised by Cheetham (1921). He noted that the List comprised 1064 species and commented, 'This is scarcely one third of the British List and much work remains to be done before the diptera fauna of the county can be considered as well worked as the coleoptera or lepidoptera.' The situation is now much improved; the Yorkshire list currently contains 4435 species out of the c.7,200 now on the British list. Until the 1960's there was little interest in diptera in the County compared with today, and recording had been dominated by C.A. Cheetham, who had started the hand-written card index of species which I still use for Dolichopodidae. His chief dipterological interest was in Tipulidae *s.l.* ('Crane-flies'), and he was honoured by having a 'new species' *Tipula cheethami* named by his friend F.W. Edwards, in 1924. Edwards worked at what is now the Natural History Museum in London, and after his untimely death in 1940, just days before his fifty-second birthday, Cheetham's interest in diptera appears to have waned somewhat. He had interests other than flies – he was an active botanist and bryologist, and in addition to his specialist nature studies he was for many years General Secretary of the YNU, and I recall as a young man seeing him at his last Union AGM at Halifax in 1953, the year before his death.

Other dipterists followed from the 1950s onwards, but, as is clear from the foregoing species' accounts, it was not until the early 1980s that interest in Dolichopodidae started to develop significantly in the County. There were two reasons for this: first the huge growth in car ownership enabling the exploration of once distant places that have now become accessible, which of course applies across all subjects of field studies, and publication in the late 1970s of a Handbook in English (Assis Fonseca, 1978), but now in need of revision. Some dolichopodid genera remain taxonomically challenging, and, as indicated earlier, the females of some

Rhaphium species are difficult, if not impossible, to name with confidence.

Acknowledgements
Thanks are due, as always, to those dipterists who have submitted records over the years, and to Andrew Grayson, YNU Recorder for Diptera, for drawing to my attention early notices of *R. appendiculatum* made by Percy H. Grimshaw in the 1907 Victoria County History which I had overlooked, and for providing current figures for National and County species lists. Special thanks are due to those who have been responsible for making past issues of *The Naturalist* readily accessible on-line. This is a remarkable facility which has been much used in compiling the historical notes in this paper. I thank Paul Cayton for his photographs of specimens from my reference collection.

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Erratum

Omitted from High Batts VC64 Excursion Report in issue no. 1102: Mollusca report by Tony Wardhaugh.

MOLLUSCA (Tony Wardhaugh)
Eighteen species were recorded during the day, all being relatively common and widespread. The Plaited Door Snail *Cochlodina laminata* tends to be associated with older woodland in Yorkshire, although it can occur in other habitats such as dry-stone walls but not usually in

secondary woods. It was found in woodland in the centre of the reserve (SE2986.7677). The Two-toothed Door Snail *Clausilia bidentata* and the Lesser Bulin *Merdigera obscura* occurred in the same general area, the latter present in considerable numbers at rest on the trunks of trees, notably Ash. A large and strongly marked Leopard Slug *Limax maximus* was found beneath a log at the north end of the reserve (SE29777694).

YNU Excursion Circulars 2020

Note: The Coronavirus restrictions in place at the time of printing will prevent the first two Excursions (VC61 and VC62) from taking place, and may also stop the later meetings listed below. Members will be informed by email if this is the case.
The reduced content of the Circulars for VC61 and 62 reflects the situation this year.

Circular No. 915

Divisional Secretary VC61: Africa Gomez
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The **VC61 Excursion** to **Flamborough** on **Saturday 16th May 2020** is now **cancelled**. It will take place on Saturday 15th May 2021.

The Area: Flamborough Head is an impressive landmark in the British coast formed by vertical chalk cliffs capped with boulder clay, jutting six miles into the sea between Bridlington and Filey bays. Flamborough Head is highly protected: designated as a Special Area of Conservation for vegetated sea cliffs, chalk reefs and caves; Special Protection Area for its breeding seabirds; a European Marine Site, with a 'no take zone'; a Site of Special Scientific Interest and a Heritage Coast. The area contains several Sites of Special Scientific Interest (SSSIs). Additional protection figures include three Local Nature Reserves (Danes Dyke, South Landing and Flamborough Outer Headland), RSPB Bempton Cliffs and YWT Flamborough Cliffs.

The flora of the headland has a maritime and a calcareous character. Clifftop fields are often under intensive agriculture and are ploughed up to the cliff path, but there is some grassland and gorse scrub in the process of naturalising, and ravines and cliff slopes hold interesting floral communities.

The cliffs of North Landing and Bempton hold the largest mainland seabird colony in the UK, which are of international importance. Northern Fulmar, Northern Gannet, Black-legged Kittiwake, European Herring Gull, Common Guillemot, Razorbill, Atlantic Puffins, and Shag breed in numbers on the cliffs, with the latest census giving totals of over 400,000 birds.

Grey and Common seals can often be seen at the Headland, in and out of the water. Porpoises, White-beaked and Bottlenose dolphins are also commonly recorded from the shore, the latter appearing to increase in numbers. South and North Landing and Selwick Bay offer excellent rock-pooling opportunities.

Circular No. 916

Divisional Secretary VC62: Sarah White
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The **VC62 Excursion** to **Duncombe Park National Nature Reserve, Helmsley** on **Saturday 13 June 2020** is now **cancelled**. It is hoped that it can be re-arranged for a similar date next year.

Meeting Place: We will meet at 10.30 am just inside the gates of Duncombe Park at SE612835. From Helmsley town centre.

The Area: The National Nature Reserve lies within the grounds of the stately home, Duncombe Park, and comprises an area of parkland, broad-leaved woodland, calcareous and neutral grassland in the valley of the River Rye. It is believed to be the richest site in Northern England for insects, notably beetles, associated with old broad-leaved woodland.

The insects of ancient woodland found at Duncombe Park are thought to occur as relict isolated populations. They include eleven species of longhorn beetle (Cerambycidae), a remarkable number for a site in northern England, exceeded only by Sherwood Forest and Dunham Park, Cheshire. Despite the earlier record of *Ischnomera cinerascens* at Moccas Park, Hereford, it has not been re-found there and its continued existence in Britain may rest solely on the Duncombe Park colony. The other two Central European species, *I. caerulea* and *I. sanguinicollis*, also occur here, as well as the nationally very local *Oedemera virescens*. Other rare southern forest dwellers include the cardinal beetle *Pyrochroa coccinea* and the large hoverfly *Pocota personata*. However, equally significant is the occurrence of the fly *Homalocephala albitarsis*, a northern forest species otherwise known in Britain only from the Spey Valley, Inverness.

The River Rye which flows through the Park is also of note for insects, including such pollution-sensitive groups as the Plecoptera and Ephemeroptera. Of the riverine species, the most notable is the uncommon stonefly *Rhabdiopteryx anglica*. Insects associated with the shingle and sandbanks include the rove beetle *Philonthus rubripennis* and the flies *Limonia ornata,* which frequents beds of Butterbur *Petasites hybridus*, and *Psilocephala rustica*.

The ancient woodland has a rich ground flora and also provides an excellent habitat for birds. The elusive Lesser-spotted Woodpecker breeds here as do Woodcock, Wood Warbler, Spotted Flycatcher, Pied Fycatcher, Nuthatch, Tree-creeper and Common Redstart. Water birds include Red-breasted Merganser, Common Sandpiper, Kingfisher, Sand Martin, Grey Wagtail and Dipper.

This will be the first YNU Excursion to Duncombe Park.

Circular No. 917

Divisional Secretary VC63: Joyce Simmons
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The **VC63 excursion** will be to the central **Dearne Valley, Barnsley** on **Saturday 4 July 2020**

Maps: 1:50,000 Landranger Sheet 111 Sheffield and Doncaster.
1:25,000 Explorer Sheet 278 Sheffield and Barnsley.

Meeting Place: Meet at 10:30 in the free car park on the A633 at SE372064 to the east of Barnsley. The car park is just north of the River Dearne bridge to the east side of the road.

Reporting Meeting: At the Mill of the Black Monks on the A633 opposite the car park at 16:00.

The area: The Dearne Valley has a long history of abuse from industries in the area. In the 1700s the river held good populations of fish, and industrial development was only just beginning. However, the construction of a canal which gave easy access to Sheffield led to the rapid development of several deep coal mines in the Dearne valley which fed the steel industry. The population here increased rapidly and their raw sewage was deposited directly into the Dearne. Upstream the woollen mills used the river for processing wool; caustic washing agents and dyes were dumped straight into the water course. The river died, except for a few pockets, but it was mostly class F – grossly polluted with little or no life. Efforts in the 1970s and 1980s led to improvements, followed by a new sewage works which was opened in 2008. The river has since been stocked with fish, which now are breeding. The opening of a fish ladder downstream on the River Don in 2014 meant that salmon were sighted in the Dearne in 2015. The status of the river is now classed as moderate/good.

The Dearne Valley was awarded a grant of £560,000 with additional resources of nearly £2,000,000 as one of the 12 Nature Improvement Areas designated in 2012. The project ran for 3 years covering 500 hectares of area to be restored as grassland, new woodlands and wetlands, with links to existing woodland and enhanced farmland.

This therefore is a new area giving scope for naturalists to investigatie how life has bounced back from the historic abuse. The Trans Pennine Trail runs west and east from the car park. To the west is Dearne Valley Country Park which is managed by YWT and to the east is farmland beside the river, including hay meadows which the farmer is keen for us to investigate.

Nearby, Monk Bretton Priory (open 10:00 to 15:00, free) is a small Cluniac Monastery founded in the 12th century. It suffered destruction in the dissolution of the monasteries in the 16th century but there are remains, particularly of the 15th century gatehouse. The rough grassland on the periphery of the site may be of interest.

Circular No. 918

Divisional Secretary VC64: Ken White
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The **VC64** Excursion will be held at YWT **Askham Bog Nature Reserve,** York, on **Saturday 18 July 2020.**

Maps: 1:50 000 Landranger Sheet: 105 York and Selby

1:25 000 Explorer Sheet: 290 York, Selby and Tadcaster

Meeting Place: We will meet at 10:30 at the Askham Bog reserve car park on A1036, SE575479. Nearest postcode YO23 2UB. There are no facilities at the car park; nearest toilets are at the Askham Bar Park & Ride, YO23 2BB.

Tea and Meeting: Everyone is welcome to join us at 16:00 at the **Pike Hills Golf Club, Tadcaster Rd., YO23 3UW,** which is on the north side of the A64 dual carriageway. From the Askham Bog car park, follow signs for Copmanthorpe. Drive through Copmanthorpe village along Top lane, which becomes Hallcroft Lane; at the T-junction turn right into Manor Heath, and at the end turn right onto the A1237, over the A64, 3rd exit off the roundabout and back onto the A64 in the Scarborough direction. After 200 metres take left slip road and turn abruptly left into Pike Hills Golf Club drive and car park. Please Note: the slip road and golf club access track comes almost immediately after joining the A64 at the Askham Bryan/Copmanthorpe junction. The golf club management have invited us to the club house and car park**,** and to use the meeting room, where there will be a modest charge for tea.

The Area: Originally a glacial lake, Askham Bog is now a valley mire lying between two arms of the York moraine. The YWT reserve extends for 88 hectares (110 acres). Alkaline water draining from the moraine has led to the development of a rich fen community. In the middle of the site, where vegetation has grown above the influence of the ground-water, conditions have become acidic through the leaching action of rain-water. Here, the growth of bog mosses *Sphagnum* spp., has given rise to an incipient raised bog. Peat-cutting in the Middle Ages removed the dome of an earlier raised bog and brought the vegetation back within the influence of base-rich ground-water with consequent reversion to fen conditions, while seral succession to woodland has also taken place. Management by grazing, and cutting of the trees and tall fen vegetation, while maintaining high water levels, has produced a mosaic of fen, woodland and meadow with the plant communities dependent on a balance between precipitation, ground water and surface water.

The richness of the site is due to the presence of acidic, base-rich and transitional conditions and it supports a number of nationally and internationally significant species and plant communities. The most recent NVC survey of Askham Bog identified 4 mire, 5 swamp/tall-herb fen and 5 woodland communities, viz. M22, M23, M25, M27, S4, S5, S24, S26, S27, W2, W4, W5, W6, W10. Almost all of these are characteristic of a variety of topogenous habitat conditions where there is a strong influence from groundwater.

Historical records show that Askham Bog was once even more rich in species, with losses over the last 100 years attributable both to loss of mineral-rich mire communities and to a general lowering of the local water table. Management by YWT aims to retain high water levels and reduce evapotranspiration; the continued influence of calcareous groundwater is critical to the maintenance of the mineral-rich fen communities. Recovery and recolonisation of several important species and communities has been achieved.

The majority of the site consists of Downy Birch *Betula pubescens* and Pedunculate Oak *Quercus robur* woodland with Alder *Alnus glutinosa* at the dyke margins. There is extensive Grey Willow carr *Salix cinerea*, and the shrub layer also includes Alder Buckthorn *Frangula alnus* and Bog Myrtle *Myrica gale*. The open fen communities are very rich in flowering plants such as Meadowsweet *Filipendula ulmaria*, Common Meadow Rue *Thalictrum flavum*,

Yellow Loosestrife *Lysimachia vulgaris*, Common Marsh Bedstraw *Galium palustre* and Woody Nightshade *Solanum dulcamara*. Sedges are particularly well represented, with 30 of the 66 species found in England, and include Fibrous Tussock-sedge *Carex appropinquata*, Elongated Sedge *C. elongata* and Great Fen-sedge *Cladium mariscus*. The site is also noted for the occurrence of Royal Fern *Osmunda regalis* and Marsh Fern *Thelypteris palustris*. More acidic elements of the ground flora include Broad Buckler-fern *Dryopteris dilatata*, Narrow Buckler-fern *D. carthusiana*, Purple Moor-grass *Molinia caerulea* and bog mosses *Sphagnum fimbriatum*, *S. squarrosus* and *S. palustre*. In addition to the peatland habitats, there is grassland along the northern and southern margins which has several species of interest such as Early Marsh-orchid *Dactylorhiza incarnata*, and the dykes are rich in aquatic plants, in particular the Water-violet *Hottonia palustris*. The site is renowned for its insect fauna which includes the scarce beetles *Dromius sigma* and *Agabus undulatus* and the moth Dentated Pug *Anticollix sparsata.*

This meeting is being held at the request of Professor Alastair Fitter who has been involved in the study and conservation of the Bog for nearly 50 years. Given the current threats, he is very keen to receive our records for all taxa, **but in particular all invertebrate groups, algae, mosses and lichens**.

More intensive management of the site over the last ten years or so has resulted in significant habitat changes, with fen meadows developing well and several more fen communities reappearing. Recent moth trapping effort has increased the list of species by 60% and Alastair believes the same is likely to be true for other taxa, most of which are currently under-recorded. Historically plants, spiders, beetles and flies have received most attention, although records for all these will be welcome in the light of the recent management work. **There are no records at all for Dermaptera, Ephemeroptera, Plecoptera and few records for Hemiptera, Hymenoptera and worms (Annelida, Nematoda etc.).**

A more ambitious restoration programme is in prospect and baseline data is needed before this takes place. Moreover, the site is under threat of an adjacent planning development of more than 500 houses; the result of the public inquiry will be known this spring.

The last YNU excursion to Askham Bog was in July 1963. Earlier visits were in 1921, 1900 and 1879, so a detailed YNU review is long overdue.

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The **VC65 excursion** is to the Howgill Fells, **Cautley Holme Beck (SD6897)** on **Saturday August 15 2020**.

Maps: 1:25,000 OS Explorer Map: OL2 Yorkshire Dales, Southern & Western Areas.

Meeting place. Nr. Cross Keys Inn, Cautley, Sedbergh (SD698969).
The Lepidoptera group are invited to trap in the area on 14 August (Friday night). Meet SD 698969, no electricity supplies are available.

Reporting Meeting at 16:00, Cross Keys Inn, Cautley, Sedbergh (SD698969).

The Area: At the South-eastern side of the Howgill fells the headwaters of Cautley Holme Beck drain the north-eastern side of Brant Fell and its linked series of summits (The Calf, 676m, Bram Rigg Top 672m & Calders 674m) as Force Gill Beck and Red Gill Beck before turning *south*-east and falling over the 169m of the Cautley Spout cascades. This cascade was formed by a classic example of glacial cirque erosion, capturing the heads of streams originally flowing northwards, to divert them over Cautley Crag. A short but wide U-shaped valley runs from the last waterfalls to join the River Rawthey, a broad and shallow torrential stream.

On the upper sides of the valley, especially on the North side under a separate peak of Yarlside (639m) are areas of scree and thin grassland running down from the small crags at 400m below Bowerdale Head and Ben End. Much of the lower slopes of the valley are covered by glacial sediments, possibly lateral moraines, and near the head of the valley a steep bank is probably a breached recessional moraine. Above these glacial structures the valley vegetation, like the treeless fells above, are typical upland acid grasslands of open fell and on enclosed 'in-bye' land.

Upland acid grassland is frequently the result of long-term grazing, where the previous habitats, woodland or dwarf shrub heath, has been grazed out.

Two thousand years BP the head of the valley was inhabited by a small iron age pastoral population and the remains of their stone and wood huts and tiny enclosures, possibly used for a few planted crops, can be seen at SD688972. The settlement is unusual in having a stone-edged trackway of unknown purpose, leading straight towards the cascades. The remains are overlain by a medieval sheep fold.

The area is still very heavily sheep grazed with consequent very short, mat-grass *Nardus stricta* dominated U5 *Nardus stricta - Galium saxatile* vegetation. The unpalatability of mat-grass

means that sheep prefer to graze almost any other plant species present, which greatly reduces the nature conservation interest of the habitat.

Where the slopes level out and become more stable, the vegetation cover increases as a mosaic of U2, U4, U5 and U13 grassland. The typical constituents of the grassland are Sweet Vernal Grass *Anthoxanthum odoratum*, Mat-grass *Nardus stricta*, Red Fescue *Festuca rubra*, Common Wood-rush *Luzula multiflora*, Heath Bedstraw *Galium saxatile*, Tormentil *Potentilla erecta*, and the mosses, *Rhytidiadelphus squarrosus*, *Dicranum scoparium* and *Pleurozium schreberi,* and more rarely, Heath Grass *Danthonia decumbens*. In the wetter areas of gleyed glacial deposits Tufted Hair-grass *Deschampsia cespitosa* and mosses are more abundant, especially the tussock forming *Polytrichum alpinum* and small patches of *Sphagnum* including the ochreous *S. capillifolium* and the red *S. papillosum.* Forbs are generally rare except on the richer soils where Foxglove *Digitalis purpurea*, Heath Bedstraw, Tormentil and smaller amounts of Lady's Smock *Cardamine pratensis,* Creeping Buttercup *Ranunculus repens,* and bitter cresses are found. The largely boring vegetation of the *Juncus effusus* dominated riparian areas is taller and enlivened by occasional Marsh Willowherb *Epilobium palustre*, Lady's Smock *Cardamine pratensis* and Creeping Buttercup *Ranunculus repens. M*ore uncommon plants such as Alpine Ladies Mantle *Alchemila alpina*, Starry Saxifrage *Saxifraga stellaris* and the rather local forget-me-not, *M. stolonifera* (originally reported as *M. brevifolia*), have been found near the stream below the cascades.

In the enclosed areas towards the river are banks with sparse scrub and trees including Rowan, hawthorn, birch, Ash and Oak *Quercus robur*. Mature trees are more evident near to the River Rawthey with some large oaks, Ash, Alder, willow spp., and Bird Cherry *Prunus padus*. Around the older residences are some large Sycamore and the occasional Beech. The fields across the river to the East are semi-improved grassland which is relatively intensively managed.

There are few zoological natural history records from this western edge of VC65; as an example there are only 11spp. of moths (7 micro-lepidoptera and 4 macro-lepidoptera) recorded in the two 1km grid squares near Cautley Beck. However the rich Bryophyte flora of Cautley Spout is well known. Wilson's Filmy-fern, *Hymenophyllum wilsonii* and the Parsley Fern C*ryptogramma crispa* is said to be abundant. Records needing recent confirmation are Gouty-moss *Oedipodium griffithianum* (Dicks.), Lesser Squirrel-tail Moss *Habrodon perpusillus* and the Angiosperm Serrated Wintergreen *Orthilia secunda.*

Hazards of the area: There are some paths but also steep ground and there are many trip hazards. Much of the area is boggy and is close to water and large streams. The latter are particularly hazardous after wet weather.

Previous YNU visits to the area Since 1877 there have been seven visits to the Sedbergh area but the most recent were in 1938 & 1961.

Accommodation

There is limited accommodation in The Cross Keys Temperance Inn, Cautley, Sedbergh LA10 5NE. Tel: 015396 20284. However in Sedbergh, 4.5 miles south on the A683, a great variety of other accommodation is available.

References

Anon (1961) YNU Excursion 599 Circular (15-16 July 1961) Sedburgh. *Naturalist Suppl*. xiii-xiv

Anon (1962) YNU Excursion Report 599, *The Naturalist*, 881 (7), 60-62.
Millward, D. & Stone, P. (2012) *Stratigraphical Framework for the Ordovician and Silurian sedimentary strata of Northern England & the Isle of Man.* British Geological Survey, Research Report RR/12/04.

YNU Calendar 2020

Events notified at time of publication are shown below. You will be aware that some of these events have already been cancelled due to the Coronavirus situation and others may have to be. Up-to-date information can be obtained from the organiser/contact indicated.

May	9	Bryological Section. Scoska Wood and Brown Scar, Littondale. VC 64. Meet 10:00 in Arncliffe, near Falcon Inn SD931718. Contact: Tom Blockeel (Tblockeel@aol.com).
	16	**VC61 Excursion.** Flamborough. Car park at TA230695. See p73. CANCELLED
	22/23	Leeds Naturalists' Club 150th Anniversary Springwatch, in partnership with Leeds City Council Parks & Countryside Service. A Bioblitz based in Meanwood Park. Contact: Andy Millard (editor@ynu.org.uk) CANCELLED
	30	Botanical Section Potteric Carr Bioblitz VC63. Meet Visitor Centre, Mallard Way, Doncaster, DN4 8DB. SE588005. Contact: Louise Hill (louise.a.hill@googlemail.com).
June	13	**VC62 Excursion.** Duncombe Park, nr. Helmsley. SE612835. See p73. CANCELLED.
	15	Botanical Section joint with NE Yorks BSBI Botany Group. Farwath in Newtondale VC62. Meet 10:30. For further details contact Wendy English (wendy.english@btopenworld.com).
	24	Botanical Section. Eskeleth Beck and Fotheringholme SSSI. VC65. Arkengarthdale. NY999037. Contact: Linda Robinson (lindarobinson157@btinternet.com).
	28	Botanical Section. Fishlake Green Lanes & Washlands. VC63. Meet at 10:00 at corner of Sour Lane & Cowick Road - Jubilee Bridge (SE674148). Parking limited; share if possible. Contact: Louise Hill (louise.a.hill@googlemail.com).
Jul	4	**VC63 Excursion.** Central Dearne Valley. Carpark at SE372064. See p74.
	18	**VC64 Excursion.** Askham Bog. Carpark on A1036. SE575479. See p75.
Aug	15	**VC65 Excursion.** Cautley Spout & Cautley Home Beck. SD698969 See p78.
Sept	23	University of Leeds MSc Field Skills Day. St. Chad's Parish Centre, Leeds. If you would like to be involved in tutoring a small group or for further information contact Paula Lightfoot (p.lightfoot@btinternet.com).
	26	Bryological Section. Jugger Howe VC62. Meet at 10:00 at Helwath Bridge SE954995. Contact: Tom Blockeel (Tblockeel@aol.com).
Oct	10	**YNU Natural Sciences Forum** (10:30-12:30) and **YNU Annual General Meeting** (13:30-16:30). St John's Methodist Church Hall, Settle BD24 9JH.
	17	Entomological Section AGM. Potteric Carr NR Education Centre. 11:00 to 16:30. Open to the public for exhibits from 13:30 onwards.

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The Naturalist

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Original articles should be submitted electronically as an MS Word document to Dr A. Millard at:
editor@ynu.org.uk

Please look at a recent issue of the journal for a general idea of how to present your article. Also see *The Naturalist* - *Guidance for authors* at www.ynu.org.uk/naturalist and please **avoid** the following:

- using any paragraph formatting and line spacings other than single.
- using tabs to tabulate information (please use MS Word table format).
- inserting any figures, graphs or plates into the text; indicate their proposed locations in the text and send them as separate files.

Good quality, high resolution images are very welcome and should be sent as .jpg files, with a separate MS Word file containing the caption and name of the person to whom the image should be attributed.

If electronic submission is not possible, contributions should be sent to Dr. A. Millard, Woodland Villas, 86 Bachelor Lane, Horsforth, Leeds LS18 5NF (Tel. 0113 258 2482).

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